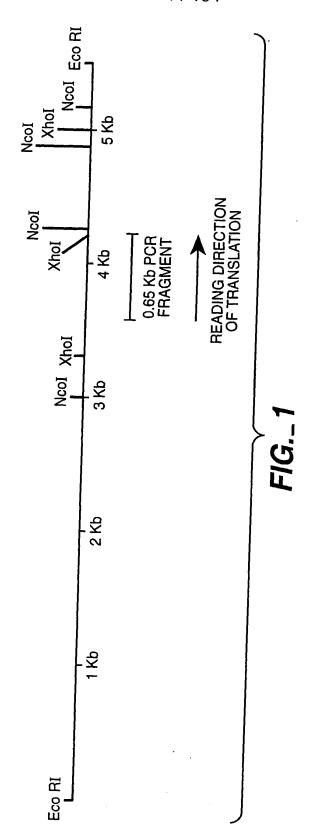
1 / 154



# S

2/154 270 360 180 450 8 GGAATATCAAAGTCTTCGGAATATCCATATTGGGAAAGGACAGAAGCTCCGGGGTAGTTGATAGATGAGCTCCGGTGTATTAAATCGGG TGTTACATCTCTCGGCTACAGCTCGAGATGTGCCTGCCGAGTATACTTAGAAGCCATGCCAGCGTGTTGTTATACGACCAAAAGTCAGGG CCATGGTGGTGTCGATATCGGCAGTAGTCTTTGCCGAAACGTTGAGGGTTACAGTGATCTGCGTCGGACATACTTCGGGGAATCTACGGC CATCCAACGGACTTCTCATACCACTCATTGACATAATTTCAAACAGCTCCAGGCGCGTTTAGTTCAACATGAAGCAATTCTCCGCCAAAC ⋖ signal sequence ഗ Sac Σ Bst1107 | Psp14061 EcoR V -02 N

"Manipulation of the Phenolic Acid Content and

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2 Sheet 2 of 154

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Superior of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 3 of 154

630		720	9	810	2	ပ	0
Pst I Bpu10 I Acetectecaga de Contrage de	Signal sequence H V L A V V V T A G H A L A A S T O G I S E D L Y S R L V E	Msc I TGGCCACTATCTCCCAAGCTGCCTACGCCGACCTGTGCAACATTCCGTCGACTATTATCAAGGGAGAAAATTTACAATTCTCAAACTG	MATISQAAYADLCNIPSTIIKGEKIYNSQT	Bamh I ACATTAACGGATGGATCCTCCGCGACGACGAGGAAATAATCACCGTCTTCCGTGGCACTGGTAGTGATACGAATCTACAACTCG	DINGWILRDDSSKEIITVFRGTGSDTNLOL	Eo Atactaacaccotcacgcotticgacaccctaccacaatgcaacggttgtgaagtacacggtggatattatattggatgggtctccg	DINYTLTPFDTLPOCNGCEVHGGYYIGWVS

FIG.\_2B

4 / 154

						4 /	154							
	066		1080				1170	•	Nco I	1260	- 1 5		1350	
BspM I Acc III	TGTCAAACAGCAGGTTAGCCAGTATCCGGACTATGCGCTGACTGTGACGGGCCACAGGTATGCCCTCG	V K O O V S O Y P D Y A L T V T G H S ApaBl Pvull	TAATACTCACTAACTCTACGATAGTCTCGGAGCGTCCCTGGCAGCACTCACT		LGASLAALTAAOLS	BsrG I Stu I	GTACACCTTCGGCGAACCGCGCGAATCAGGCCTTCGCGTCGTACATGAACGATGCCTTCCAAG	LYTFGEPRSGNOAFASYMNDAFO	BspM I	CCTCGAGCCCAGATACGACGCAGTATTTCCGGGTCACTCATGCCAACGACGGCATCCCAAACCTGCCCCGGGTGGAGCAGGGGTACGCCC	OYFRVTHANDGIPNLPPVEOGYA		SCGTTGATCCTTACAGCGCCCAGAACACATTTGTCTGCACTGGGGATGAAGTGCAGTGCTGTGAGGCCC	SVDPYSAQNTFVCTGDEVQCCEA
Tth111	TCCAGGACCAAGTCGAGTCGCTTGTCAAAC	V O D O V E S L	TGATITCTTICAATTAAGTGTATAATACTC	.i			CGACATACGACAACATCCGCCTGTACACCT	ATYDNIRL	Xho I	CCTCGAGCCCAGATACGACGCA	ASSPOTTOY	Sca –	ATGGCGGTGTAGAGTACTGGAGCGTTGAT	» → B O D H

FIG.\_2C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted September 2015 of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 5 of 154

5 / 154

		5 / 154		_		
1440	1530	1620	1710	Ppu10 I	1800	1890
	BSpLU111	Dra I		<u> </u>	CAGCCTAAA	Eco311
BCII	GGTAAATCAGG	GAATATATATT	ATGATGAGCG/	=	AAATATGAAT	Nco I
BsrG1 B	SACACTITITC	CTTTTGATTGT	AGACCCCTTGA	 	AAGGTAGTAC	Nhe I
BsrB I GAGCGGAGCCT	SnaB I Bst1107 I	3TTGCCTTTCT(	TGTCACGTGAT		AACCCCATTCT	Earl Sapl
GACTTATTTTGGGATGAC	Ppu10   BfrB   SnaB   Sph   Bst1107   AGAGGGCATGCATGTACCCGAAGCACACTTTTTCGGTAAATCAGGACATGTAAT	TCACCATAAGCCTTGAGG	TAAACCCATCATAGATTG		AGCACAGTCAGAATACACCCCAATTCTAAGGTAGTACTAAATATGAATACAGCCTAAA	Earl Nhel Ncol Eco31 AACAACCTTTCAGATCTCGTTTTGCGCTGCGAAGAGGCTAGCTCTACCATGGTCTCAATTAT
FSP I  AGGGCGGACAGGGTGTGAATAATGCGCACACGACTTATTTTGGGATGACGGAGCCTGTACATGGTGATCAGTCATTTCAGCCTCCC	CGAGTGTACCAGGAAGATGGATGTCCTGGA	Dra I  AAGTTCCTTCCATGAATAGATATGGTTACCCTCACCATAAGCCTTGAGGTTGCCTTTCTCTTTTGATTGTGAATATATAT	ECOR V TGACAGATATCTCTAAACACCTTAATCCGCTTAAACCCATCATAGATTGTGTCACGTGATAGACCCCTTGAATGATGAGGCGAAATGTATCA	Dra 1	GTCCCGTTTAAATCAAACCCTTTCAGCCTA(	BfrB 1 TGCATCGCTATATGATCCCATAAAGAAGCA
AGGGCGGAC	CGAGTGTAC	AAGTTCCT	TGACAGAT		GTCCCGTT	BfrB 1 TGCATCGC

FIG.\_2D

,				EcoR I
2430	ACCCCATATTAATCT	TTGCGTGGGTCGTTCGTGTTACTGCGACGCAGATTCTGTAGGCAAGGCGCAGGGCTCTTTTGAGGTAGAAACACCCCATATTAATCT	CTGCGACGCAGATTCTGTAGGCAAG	TTGCGTGGGTCGTTCGTGTTA
	Vsp I	Ear I	Alwn I	
2340	ATACTGTGTTTTCCA	AAGCGGCCACACTTCCACGTCGGTACTGGATGGGTTGCGCGTGGCCATACTGTGTTTTCCA	GATCATAAAAGCGGCCACACTTCCA	GTTGAATTGTGCAAATGCCGAGATCATAA
<del>-</del>	cl BsrD I	Xcm I Msc I		
2250	ATCCGTCGGCCGCAC	CAATCCTGTTCAAATGCCAAGACCCGCCTCCTACCACATGTAAGGCATCCGTCGGCCGCC	ACCGTGGCCAATCCTGTTCAAATGC	TCGTGTGCAGCATGAGATGAGACCGTGGC
		BspLU111	MscI	Eco31 1
2160	STAAACCGATGATGA	ATTTCCAATCTCAGCTTTACGAAGATATGCCCATGGTGGAGGGTTAGTAAACCGATGATGA	ATATTTGAATTTCCAATCTCAGCTT	TGATAGCGTTGAGAAGGCCCTATATTTGA
<del></del>	BsaB	Nco I		
2070	SACCCAGACCCCTGT	CTTCTTCACATCTCGAGGAGTTGTCTACACGTCGCGTCCATGTCATAAGCCGGTACTCGACGTTGTCGTGACCGTGACCCAGACCCTGT	TGTCTACACGTCGCGTCCATGTCAT	CTTCTTCACATCTCGAGGAGT
			BseR I	X Tho
1980	AGGTAGGATCCCGGG	GAGTGGAGCGTTTAGTCTCGTTTAAGCCTAGCTATCTTATAAGGACAACACATGTACATGGGCTTACTTGTAGAGAGGTAGGATCCCGGG	TTAAGCCTAGCTATCTTATAAGGAC	GAGTGGAGCGTTTAGTCTCGT
	Sma	Brd I		
	BamH I			

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targetell 9 9 1 1 1 0 7 1 2 1 2 Expression of Genes Encoding Cell Wall .." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 7 of 154

7 / 154

**TCACGCCTTTCGACACCCTACCACAATGCAACGGTTGTGAAGTACACGGTGGATATTATATATTGGATGGTCTCCG TCCAGGACCAAGTCGAGTCGCTTGTCAAACAGCAGGTTAGCCAGTATCCGGACTATGCGCTGACTGTGACGGGCC AGGGCGGACAGGGTGTGAATAATGCGCACACACTTATTTGGGATGACGAGCGGAGCCTGTACATGGTGATCAG** TAAACCCATCATAGATTGTGTCACGTGATAGACCCCTTGAATGATGAGCGAAATGTATCAGTCCCGTTTAAATCA CATGGTCTCAATTATGAGTGGAGCGTTTAGTCTCGTTTAAGCCTAGCTATCTTATAAGGACAACACATGTACATG **GGCTTACTTGTAGAGAGGTAGGATCCCGGGCTTCTTCACATCTCGAGGAGTTGTCTACACGTCGCGTCCATGTCA** TAAGCCGGTACTCGACGTTGTCGTGACCGTGACCCCAGACCCCTGTTGATAGCGTTGAGAAGGCCCTATATTTGAA TTTCCAATCTCAGCTTTACGAAGATATGCCCATGGTGGAGGGTTAGTAAACCGATGATGATCGTGTGCAGCATGA GATGAGACCGTGGCCAATCCTGTTCAAATGCCAAGACCCGCCTCCTACCACATGTAAGGCATCCGTCGGCCGCAC GTTGAATTGTGCAAATGCCGAGATCATAAAAGCGGCCACACTTCCACGTCGGTACTGGATGGGTTGCGCGTGGCC GATAGATGAGCTCCGGTGTATTAAATCGGGAGCTGACAGGAGTGAGCGTCATGTAGACCATCTAGTAATGTCAGT CGCGCGCAATTTCGCACATGAAACAAGTTGATTTCGGGACCCCATTGTTACATCTCTCGGCTACAGCTCGAATG TGCCTGCCGAGTATACTTAGAAGCCATGCCAGCGTGTTGTTATACGACCAAAAGTCAGGGAATATGAAACGATCG CATCCAACGGACTTCTCATACCACTCATTGACATAATTTCAAACAGCTCCAGGCGCATTTAGTTCAACATGAAGC **AATTCTCCGCCAAACACGCCTCGCAGTTGTGGTGACTGCAGGGCACGCCTTAGCAGCCTCTACGCAAGGCATCT** CCGAAGACCTCTACAGCCGTTTAGTCGAAATGGCCACTATCTCCCAAGCTGCCTACGCCGACCTGTGCAACATTC **ACAGGTATGCCCTCGTGATTTCTTTCAATTAAGTGTATAATACTCACTAACTCTACGATAGTCTCGGAGCGTCCC** TGGCAGCACTCACTGCCGCCCAGCTGTCTGCGACATACGACATCCGCCTGTACACCTTCGGCGAACCGCGC GCGGCAATCAGGCCTTCGCGTCGTACATGAACGATGCCTTCCAAGCCTCGAGCCCAGATACGACGCAGTATTTCC **GGGTCACTCATGCCAACGACGGCATCCCAAACCTGCCCCCGGTGGAGCAGGGGTACGCCCATGGCGGTGTAGAGT** <u> ACTGGAGCGTTGATCCTTACAGCGCCCAGAACACATTTGTCTGCACTGGGGATGAAGTGCAGTGCTGTGAGGCCCC</u> **GAGGTTGCCTTTCTCTTTTGATTGTGAATATATATTTAAAGTAGATGACAGATATCTCTAAACACCTTATCCGCT AACCCTTTCAGCCTAGCACAGTCAGAATACACCCAACCCCATTCTAAGGTAGTACTAAATATGAATACAGCCTAAA** <u> ATACTGTGTTTTCCATTGCGTGGGTCGTTCGTGTTACTGCGACGCAGATTCTGTAGGCAAGGCGCAGGGCTCTCT</u> CCATGGTGGTGTCGATATCGGCAGTAGTCTTTGCCGAAACGTTGAGGGTTACAGTGATCTGCGTCGGACATACTT CGGGGBATCTACGGCGGAATATCAAAGTCTTCGGAATATCCATATTGGGAAAGGACAGAAGCTCCGGGGTAGTTT **TCTGAGGTAGAAAACACCCCATATTAATCTGAATTC** 

SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 8 of 154 8 / 154 intron position in original complement, FAE-I5 FAE-I3 40-mer CCCTCGGCGCCTCCCTGGCGGCACTC ᆸ 35-mer ø ď ᆸ Ŋ Ø CCICGGCGCC ø ø ט  $\mathcal{O}$ Н -H CCGGCCACG 呂 出 Ö Ö Н Н > E  $\vdash$ 口 П

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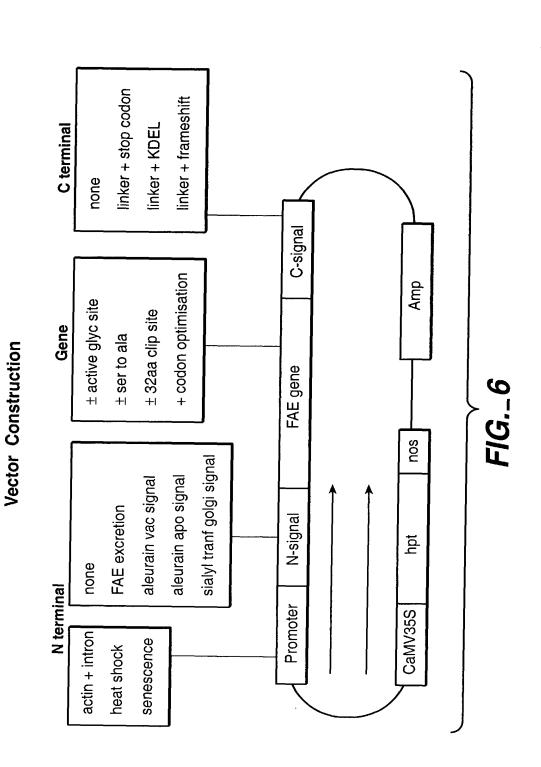
FAE-I3 FAE-IS Z,

FAE-13

FAE-S5 or FAE-N5

FAE-15

9 / 154



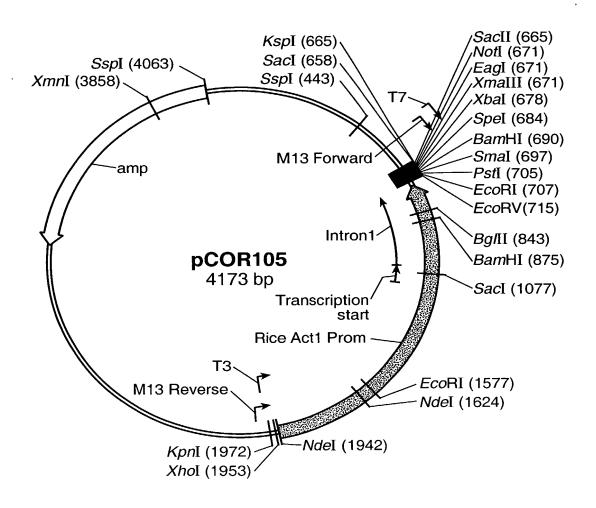


FIG.\_7

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted".

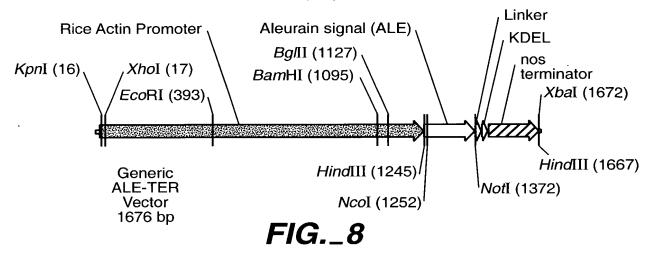
Expression of Genes Encoding Cell Wall..."

SN# 09/991,209, Dunn-Coleman et al.

Docket No. GC648-2

Sheet 11 of 154

#### 11 / 154



#### KDEL-COOH ER retention sequence

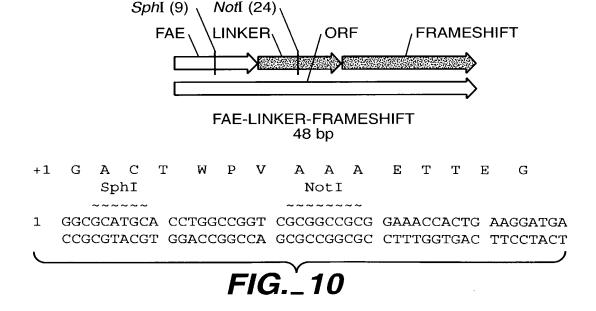
NotI

A A A K P L K D E L \*

L GCGGCCGCGA AACCACTGAA GGATGAGCTG TAA

FIG.\_9

#### **FAE-LINKER-FRAMESHIFT Structure and Sequence**



See1	1	UB8.1	1	·		•	ı	ı	,	•	,	ı	PJQ5.2			FIG 11
H.S.	1	UK3	UK12	UK13	UK6	UC5.1	UK2	UH10	UH11	J K	•	1	l *	,		Linker
Actin	(+hyg)	UH4	0H6	0H7	OH5	НОХЗ	OH3	UH8	OH9	UF1	ı	pJQ4.9*	pJQ3.2*	pJO6.3*		
	Target (	VAC	APO	APO	VAC	VAC	VAC/E.R.	E.R.	E.R.	E.R.	APO	GOLGI	APO	VAC	CO Site)	Linker
(A				1				ı	ı				i	I	stored N	Stop codon
Plant Transformation Cassettes		——————————————————————————————————————		——————————————————————————————————————											* - Modified Actin Promoter (Kpn1-EcoR1 Deletion and Restored NCO Site)	Aspergillus FAE Signal
	tin + hyg		ı	I	ļ	(S)		ı	ł		ı	ı	l	ı	Promot ר	Signal
	Original Actin + hyg	TR9.4	TR5.5	ı	1	TR8 (glycos)	ı	ı	ı	TR6.1	TR2				Aodified Actir	RST Signal
/ectors	HS.	T13	•		ı	•	•	•		112	ı				*	Aleurain NPGR
Initial Vectors	Original Actin	TP11.1	TT5	UA4.4	TP8.5	TP3.1	TU4	TU5	n B	TP5.1	TP4	TP3.1	TP3.1	TP3.1		Aleurain

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Content and Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al Docket No. GC648-2
Sheet 13 of 154

### 13 / 154

#### **Vectors**

#### Original Actin promoter in pCOR105

	Target	Signal sequences	Vectors
(i)	APO	- aleurain-NPGR-FAE	pUH6, pTT5, TT5.5, pTT5.1
		- aleurain-delNPIR -FAE	pUH7, pUA4.4,
(ii)	ER	<ul> <li>aleurain-NPGR-FAE-linker-KDEL</li> </ul>	pTU5, pUH8,
		- aleurain-delNPIR-FAE-linker-KDEL	pUG4, pUH9,
(iii)	VAC	- aleurain-NPIR-FAE	pTP11.1, pTR9.4, pUH4, pUK3,
(iv)	ER/VAC	- aleurain-NPIR-FAE-linker-KDEL	pTU4, pUH3,
(v)	VAC	- aleurain-NPIR-FAE-linker-frameshift	pUA1K3, pTP3.1, pUC5.11
(vi)	VAC	- aleurain-NPIR-FAE-linker-stop	pTP8.5, pUH5
(vii)	ER	- Aspergillus signal -FAE-KDEL	pTP5.1, pTP6.1, pUF1,

#### Modified actin promoter (Kpn1-EcoR1 deletion and restored NCO site)

(i)	VAC	- aleurain-NPIR-FAE-linker-frameshift	pJ06.3
(ii)	GOLGI	- RST-FAE-linker-frameshift	pJQ3.2
(iii)	APO	- PPI-FAE-linker-frameshift	pJQ4.9

#### Heat-shock promoter

(i)	APO	- aleurain-NPGR-FAE	pUH12
		- aleurain-delNPIR-FAE	pUH13
		- Aspergillus signal-FAE	pTP4a2, pTR2.22,
(ii)	ER	- aleurain-NPGR-FAE-linker-KDEL	pUH10
		- aleurain-delNPIR-FAE-linker-KDEL	pUH11
(iii)	VAC	- aleurain-NPIR -FAE	pUK3,pTT3
(iv)	ER/VAC	- aleurain-NPIR-FAE-linker-KDEL	pUK2
(v)	VAC	- aleurain-NPIR-FAE-linker-frameshift	pUC5.11, pHOX3
(vi)	VAC	- aleurain-NPIR-FAE-linker-stop	pUK6
(vii)	ER	- Aspergillus signal -FAE-KDEL	pUK1, pTT2

#### Senescence promoter

(i)	APO	<ul> <li>See1-PPI-FAE-linker-frameshift</li> </ul>	pJQ5.2
(ii)	VAC	- See1-aleurain-deleted NPIR-FAE	pUB8.1

## FIG.\_12

14 / 154

## ALEURAIN-NPIR (Vacuolar) and NPGR (Apoplast) Structure and Sequence

**NPIR** Underline NPGR Bold NcoI (9) **NPIR** HindIII (2) NotI (129) **ORF NPGR ALEURAIN-NPIR** 134bp +1 AHA R V L LLAL HindIII NcoI 1 AAGCTTACCA TGGCCCACGC CCGCGTCCTC CTCCTGGCGC TCGCCGTGCT GGCCACGGCC GCCGTCGCCG TTCGAATGGT ACCGGGTGCG GGCGCAGGAG GAGGACCGCG AGCGGCACGA CCGGTGCCGG CGGCAGCGGC +1 V A S S A D S ΡI R V T D RAA NotI ~~~~~~ 71 TCGCCTCCTC CTCCTCCTTC GCCGACTCCA ACCCGATCCG GCCCGTCACC GACCGCGCGC CCGC AGCGGAGGAG GAGGAGGAAG CGGCTGAGGT TGGGCTAGGC CGGGCAGTGG CTGGCGCGCC GGCG

FIG.\_ 13

15 / 154

RAT SIALYL TRANSFERASE Golgi signal sequence

HindIII

CCICGICIIC CICCICIICG CCCTCTTCAT Ы ഗ AAGCTTACCA TGATCCACAC CAACCTCAAA AAGAAGTTCT Ēų  $\Xi$ 

ᆸ

Q A K E F Q M CAAGCCAAGG AGTTCCAAAT CCTCACCCTC ы H Д · V I C V W K K G S D Y E A CCGTGATCTG CGTGTGGAAG AAGGGCTCCG ACTACGAGGC

262365255 141

NotI

71

POTATO PROTEASE INHIBITOR II Apoplast signal sequence

HindIII

AACTTCGTSG ø z CAAGGAGGT > 团 AAGCTTACMA TGGMCGTGCA × GGCCTCCTCT Σ

Ncol

Ö U 闰 × O 4 × 4 A > H 国 Σ Ø ט H F Q

Ы

z

CACGIGGACG CCAAGGCCIG CACCCKCGAG TGCGGCAACC CGCCATGGAG TGCTCGTSTC 71

TCGGCTTCGG

NotI

CATCTGCCCG

141

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

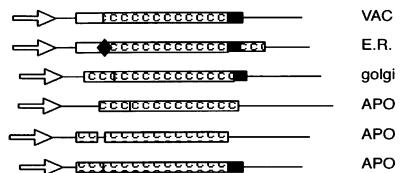
Docket No. GC648-2

Sheet 16 of 154

#### 16 / 154

#### **Targeting Expression of gfp to Different Cell Compartments**

#### **Actin Promoter Targeting Vectors**



Actin Promoter	िहरू Aspergillus signal

Aleurain signal (NPIR) 🖾 Aleurain signal I (del – NPIR)

Aleurain signal (NPGR) 🔳 linker + stop codon

linker + KPLKDEL Potato protease inhibitor

silyl transferase

## FIG.\_ 16A

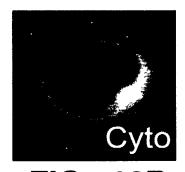


FIG.\_16B



FIG.\_16C

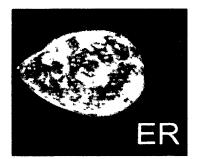


FIG.\_16D



FIG.\_16E

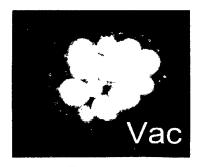


FIG.\_16F

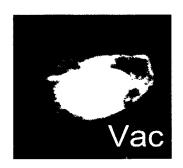


FIG.\_16G

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Pargeted Expression of Genes Encoding Cell Wall .."
SN# 09/991,209; Dunn-Coleman et al.
Docket No. GC648-2
Sheet 17 of 154

#### 17 / 154

## FAE Activity in Transgenic *Festuca arundinacea* Leaves of Different Ages Under ER and APO Targeting Sequence

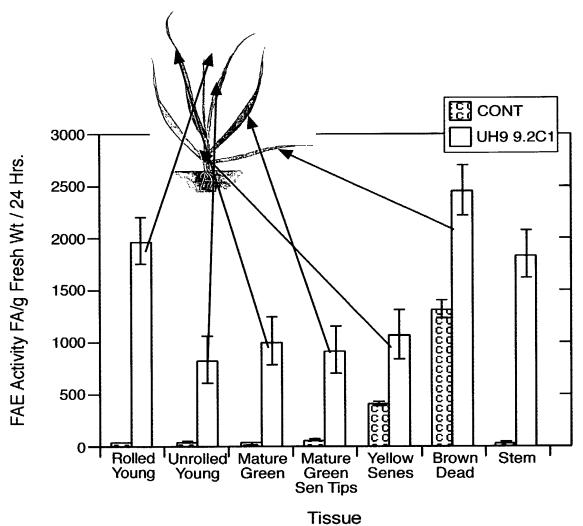


FIG.\_17A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted"

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 18 of 154

18 / 154

## FAE Activity in Transgenic *Festuca arundinacea* Leaves of Different Ages Under ER and APO Targeting Sequence

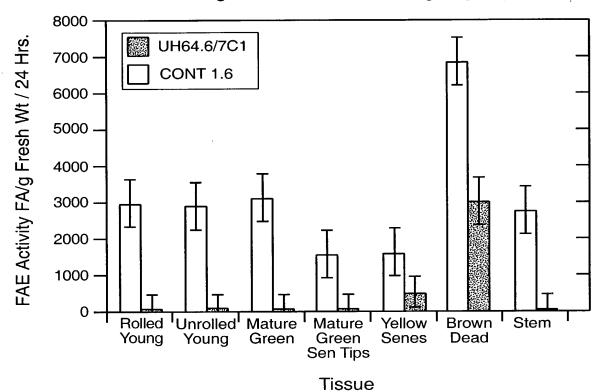


FIG.\_17B

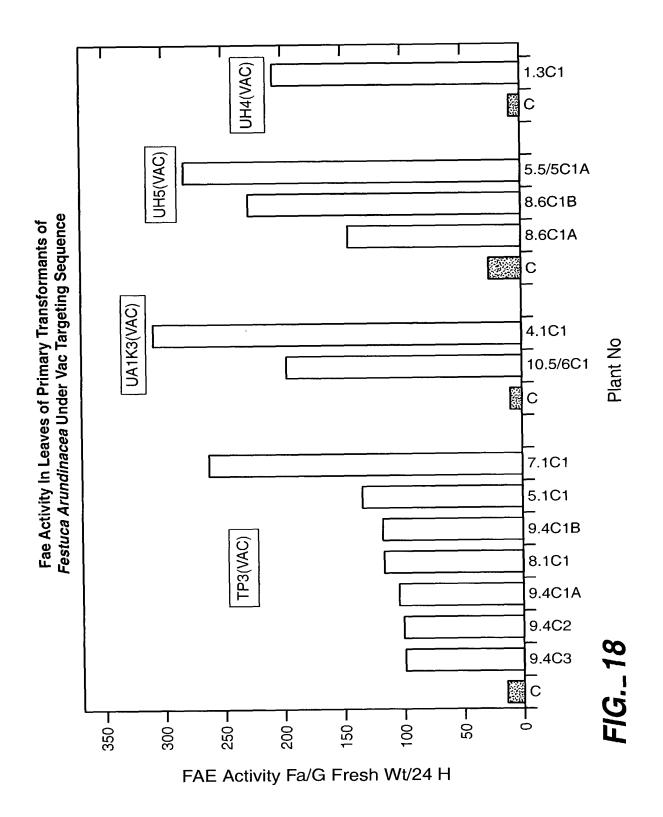
"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 19 of 154

19 / 154



"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 20 of 154 20 / 154 FIG.\_19 ÇÇ hph 130-35 cm | 30-35 cm | Yellow Brown Leaves Leaves **ECC** CaMV35s Linker Frameshift KDEL l 30-35 cm Mature Leaves Tissue 25-30 cm Mature Leaves FAE 15-20 cm Unrolled Leaves Alu T 5-10 cm Rolled Leaves pUA1-K3 VAC 0 100 200 T 200-**-009** 4004 300 FAE Activity μg FA/g Fresh Wt / 24 Hrs.

UA1K3 5.4DC1

[집 Control

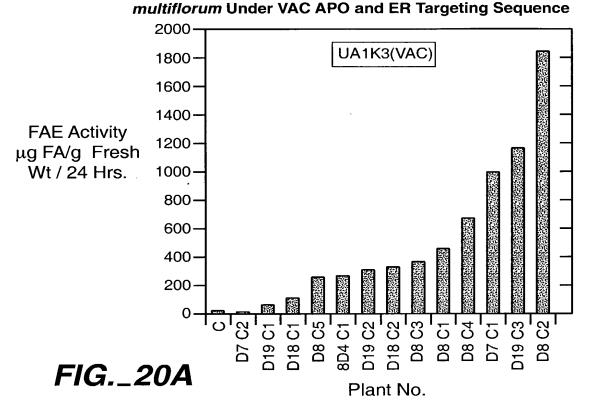
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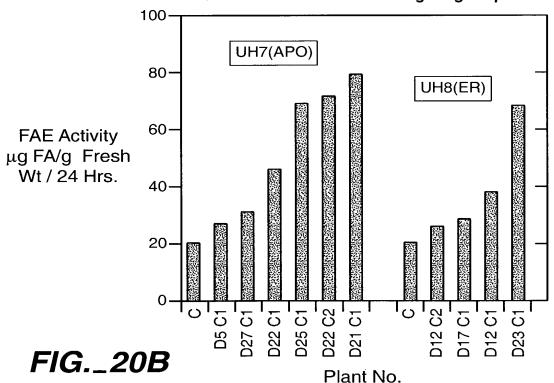
FAE Activity in Lolium mutiflorum Leaves of Different Ages

21 / 154

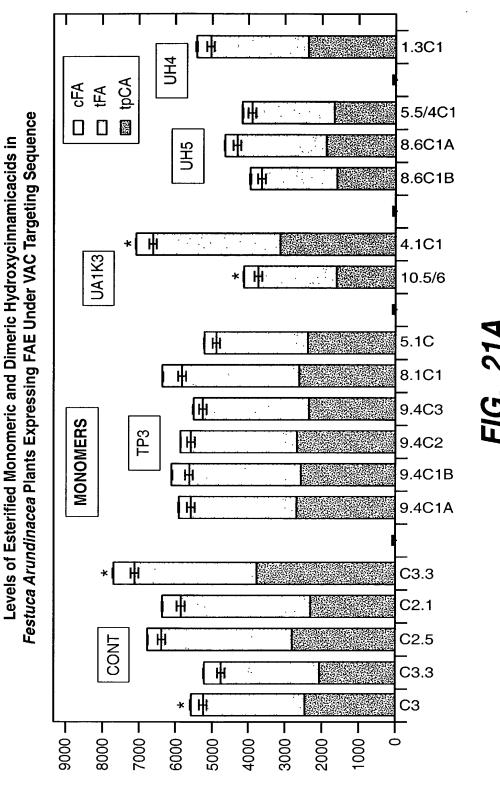
FAE Activity in Leaves of Primary Transformants of *Lolium* 



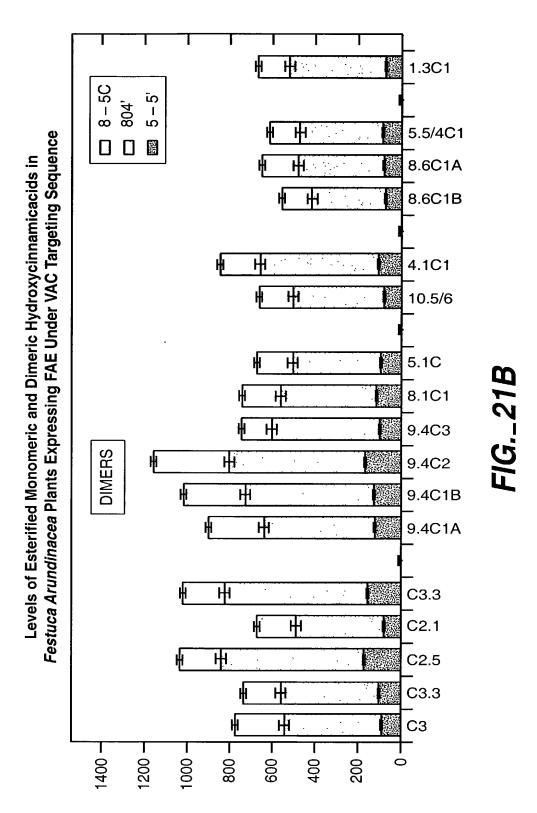
FAE Activity in Leaves of Primary Transformants of *Lolium* multiflorum Under VAC APO and ER Targeting Sequence



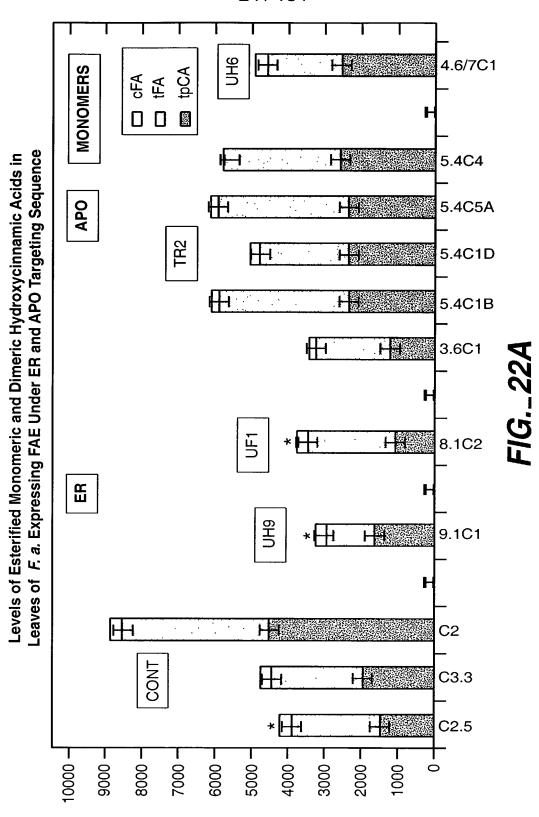
22 / 154



ug Hydroxycinnamic Acids g DM-1



ug Hydroxycinnamic Acids g DM-1



ug Hydroxycinnamic Acids g DM-1

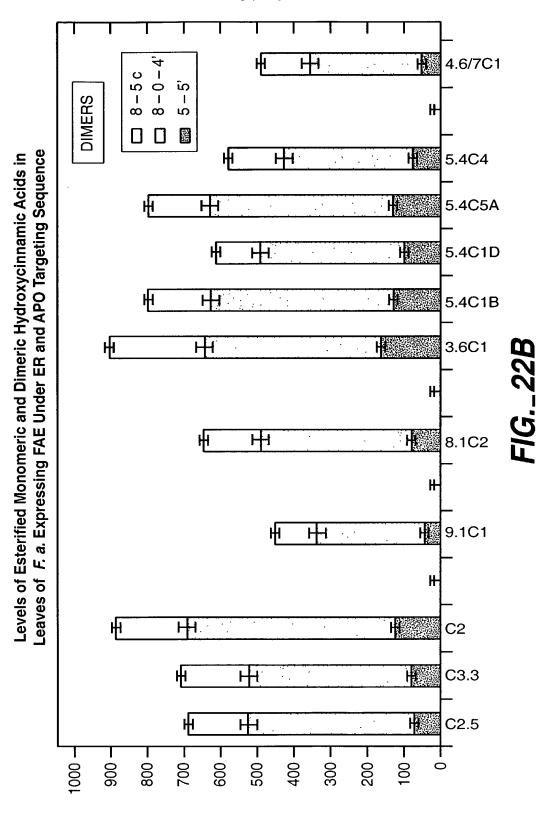
"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Papersision of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 25 of 154





ug Hydroxycinnamic Acids g DM-1

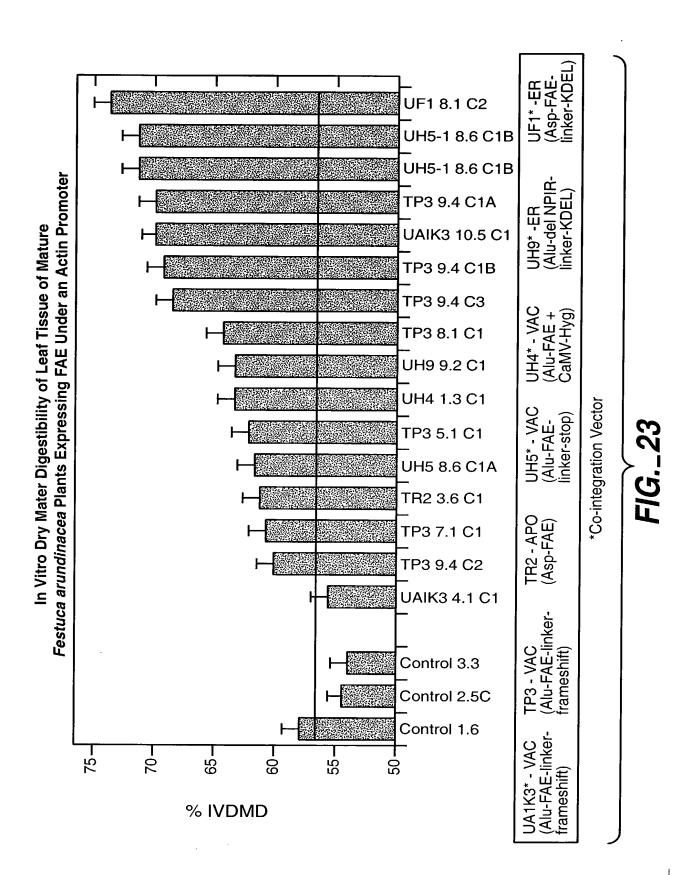
"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

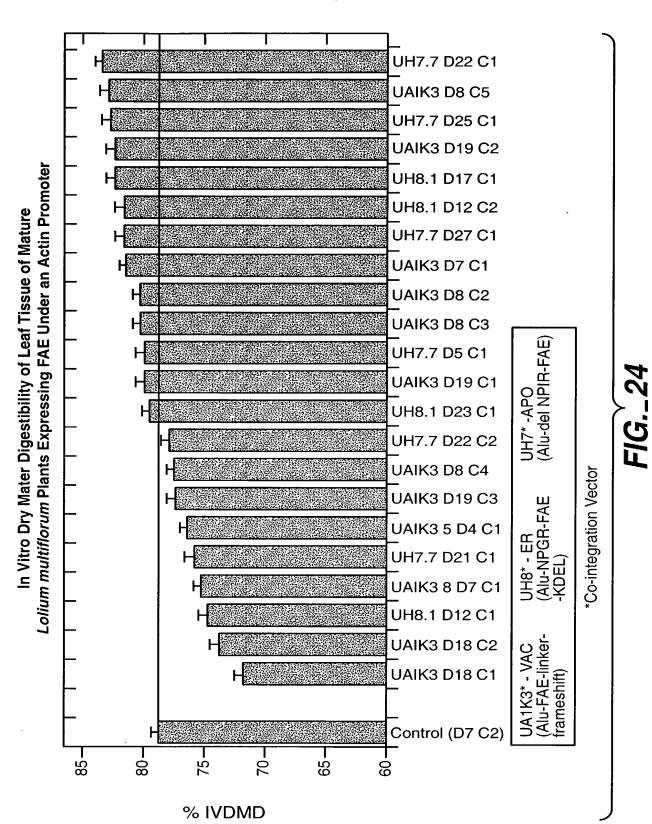
26 / 154

Sheet 26 of 154



"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Taigleted | Fig. 1 | Fig. 2 | Fig. 2

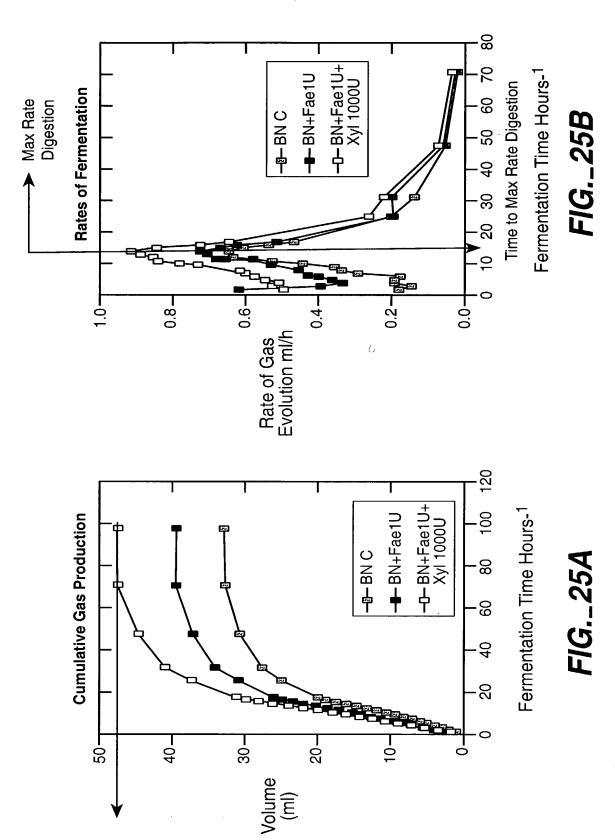
27 / 154



"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Digestibility of Plant Cell Walls by Targeted Digestibility of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al Docket No. GC648-2

Sheet 28 of 154



29 / 154

## In-vitro Fermentation of *Festuca arundinacea* <u>Cell Walls</u> From Cell Cultures Expressing Recombinant FAE1

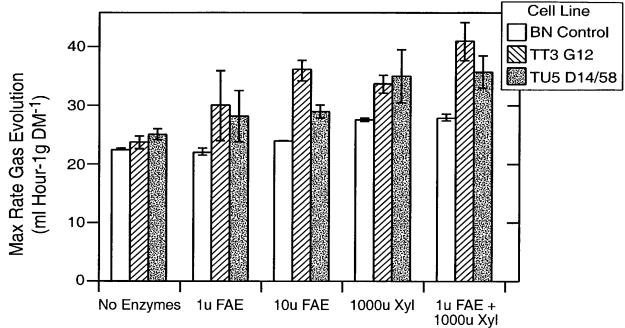
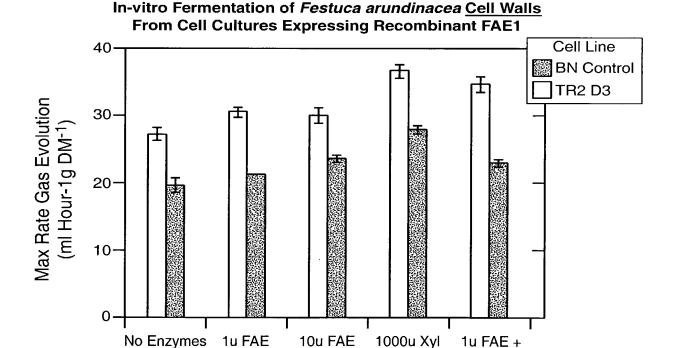


FIG.\_26A Maximum Rate of Digestion



1000u Xyl

FIG.\_26B Maximum Rate of Digestion

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 30 of 154

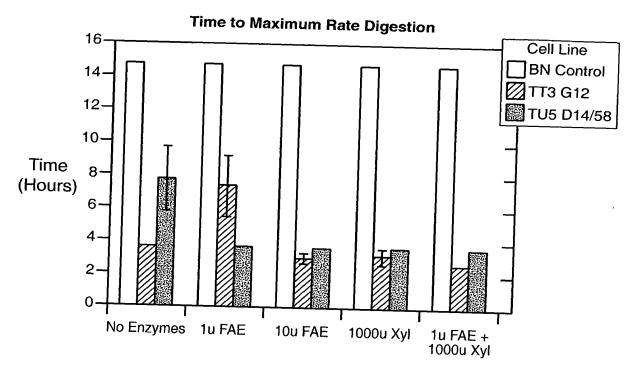


FIG.\_27A

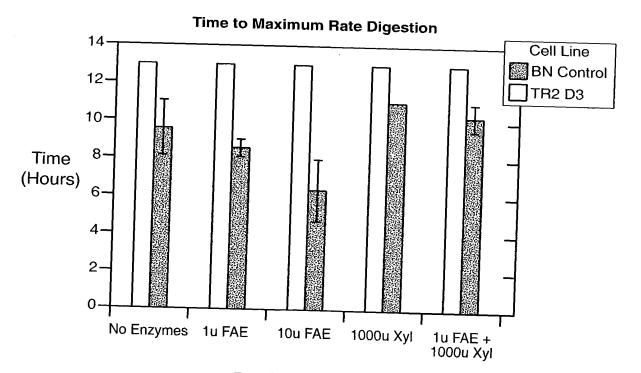


FIG.\_27B

31 / 154

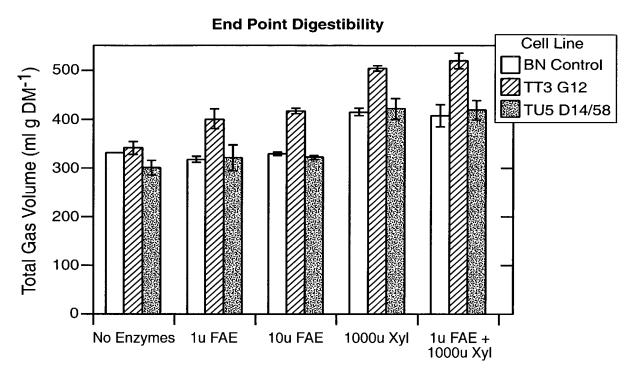


FIG.\_28A

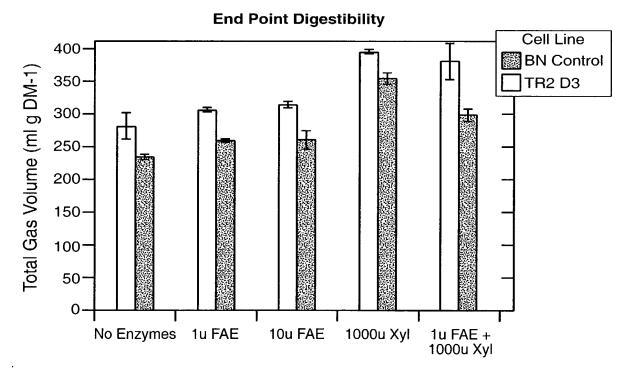
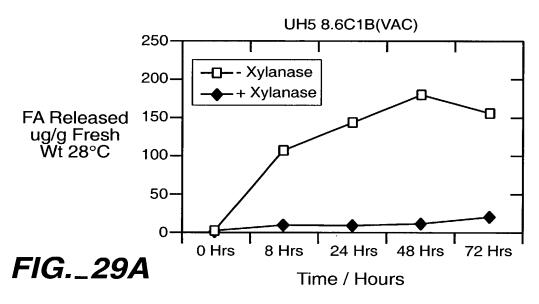


FIG.\_28B

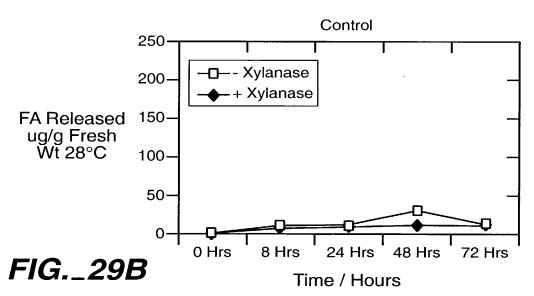
- "Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted 11 2 17 17 17 17
- Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al.
- Docket No. GC648-2 Sheet 32 of 154

32 / 154

#### Kinetics of FAE Activity by Ferulic Acid Release from Cell Wall under Self Digestion in *Festuca arundinacea* and Stimulation by Xylanase



# Kinetics of FAE Activity by Ferulic Acid Release from Cell Wall under Self Digestion in *Festuca arundinacea* and Stimulation by Xylanase.



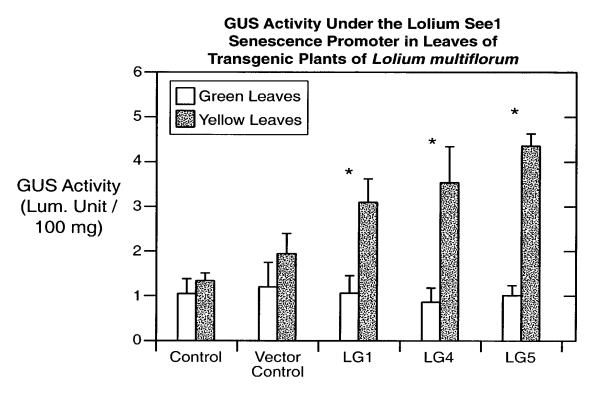


FIG.\_30

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 34 of 154 34 / 154 UA1K3 Ω ດ໌ tpCA , 8 CONT ŧFΑ S 簽 N CONT UH5 CONT 120 8 40 0 HCAs Released µg/ g /Fresh Wt / 72Hrs UA1K3

Release of Monomeric and Dimeric HCAs on Self Digestion of Leaves of Vacuolar 4 \_ CONT Targeted FAE Expressing Plants 8 - 5, 0 ú tpCA 5 tFΑ  $\infty$ 簽 Xylanase CONT CHS CONT 40 120 8 160 0

HCAs Released µg/ g /Fresh Wt / 72Hrs

4

0

ω

160

Release of Monomeric and Dimeric HCAs on Self Digestion of Leaves of Vacuolar

Targeted FAE Expressing Plants

+ Xylanase

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted To The Theorem Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.
Docket No. GC648-2
Shect 35 of 154

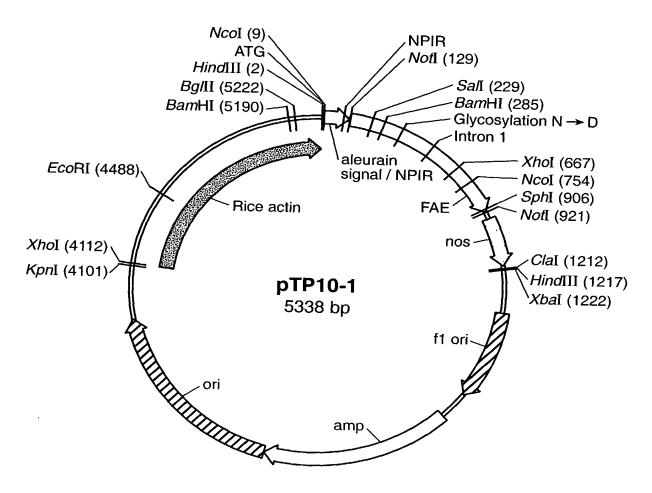


FIG.\_32A

36 / 154

GGCCACGGCC GCCGTCGCCG Þ H ď CICCIGGCGC ICGCCGIGCT > ď Н ⋖ Д ᆸ CCGCGTCCTC H > ĸ AAGCTTACCA TGGCCCACGC ø Ξ

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GACCGCGCGG GCCCGTCACC TCGCCTCCTC ß ď

TITAGICGAA AIGGCCACIA ICICCCAAGC IGCCIACGCC GCAGGGCATC TCCGAAGACC TCTACAGCCG 71 141

SalI

Ø S Z ĸ AAGGGAGAGA 闰 Ö GACTATTATC Н Ø GACCTGTGCA ACATTCCGTC Д ບ Д 211

BamHI

GGCACTGGT Ö CCGCGACGAC AGCAGCAAAG GATGGATCCT 281

Glycosylation

TCTGCGACAT ACGACAACAT CCGCCTGTAC ACCTTCGGCG AACCGCGCAG CGGCAATCAG CACGGTGGAT ATTATATTGG ATGGGTCTCC GCCAGTATCC GGACTACGCG CTGACCGTGA O H 351 421 491 561

CGCGCAAACT AGGATAAATT ATCGCGCGCG

37 / 154

闰 Ċ GACGCAGTAT NCOL 0 GCCCAGATAC А O CAAGCCTCGA CGATGCCTTC ď А CGTACATGAA GCCTTCGCGT

XhoI

CCCCGGTGGA GCAGGGTAC GCCCATGGCG GTGTAGAGTA CTGGAGCGTT GATCCTTACA GCGCCCAGAA CACATTTGTC TGCACTGGGG ATGAAGTGCA GTGCTGTGAG CTCATGCCAA CGACGGCATC CCAAACCTGC ა | 4 耳 701 771

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GACGAGCGGC ល CACACGACTT ATTTTGGGAT × Ö Ē × H Н 二 GCCCAGGGCG GACAGGGTGT GAATAATGCG z Z Ö Ö Ö O 841

KDEL NotI

TTAGAGTCCC AAAGAAGCAG ATCGTTCAAA CATTTGGCAA TTGAATTACG TGATTATCAT ATAATTTCTG GTTTTTTGA TATGAGATGG ACCACTGAAG GATGAGCTGT ATGTAATGCA TGACGTTATT TCCTGTTGCC GGTCTTGCGA TTAAGCATGT AATAATTAAC GGCCGCGGAA TAAGATTGAA TAAAGTTTCT GGCCGGTCGC 1051 1121

CGATAGAAA CAAAATATAG

GCAATTATAC ATTTAATACG

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CGTTACCCAA ACCGATCGCC CCTATAGTGA AGAGGCCCGC GGCGCATTAA TCCAATTCGC AAAACCCTGG CGTGACTGGG GTAATAGCGA CCGGTGGAGC GCCCTGTAGC CTGAATGGCG AATGGGACGC TCTAGAGCGG TTTACAACGT GCCAGCTGGC TGGCCGTCGT TGTTACTAGA TCGATAAGCT TCCCCCTTTC GTTGCGCAGC TTGCAGCACA GCGCGCTCAC GTGTCATCTA GTCGTATTAC CTTAATCGCC CTTCCCAACA 1261 1331 1401

38 / 154

CGCTTTCTTC	TTAGGGTTCC	GTGGCCCATC	CTTGTTCCAA	ATTTCGGCCT	CGCTTACAAT	CATTCAAATA	GTATGAGTAT	TCACCCAGAA	CTGGATCTCA	TTAAAGTTCT	ACACTATTCT	GTAAGAGAAT	TCGGAGGACC	GGAACCGGAG	ACGTTGCGCA	AGGCGGATAA	TGGAGCCGGT	GTAGTTATCT	CCTCACTGAT	TCATTTTAA	GAGTTTTCGT	TGCGCGTAAT	GCTACCAACT	TAGCCGTAGT	TACCAGTGGC	TAAGGCGCAG	GAACTGAGAT	ATCCGGTAAG	TTATAGTCCT	AGCCTATGGA	TGTTCTTTCC	TCGCCGCAGC	CCGCCTCTCC	GCAGTGAGCG
CCGCTCCTTT	GGGCCTCCCT	GGTTCACGTA	ATAGTGGACT	GATTTTGCCG	AAAATATTAA	TTTCTAAATA	AAAAGGAAGA	CTGTTTTTGC	TTACATCGAA	ATGAGCACTT	GTCGCCGCAT	TGGCATGACA	CTGACAACGA	TTGATCGTTG	AATGGCAACA	GACTGGATGG	CTGATAAATC	CTCCCGTATC	GAGATAGGTG	ATTTAAAACT	CCCTTAACGT	CCTTTTTTC	CGGATCAAGA	CCTTCTAGTG	CTAATCCTGT	AGTTACCGGA	GACCTACACC	GCGGACAGGT	CCTGGTATCT	AGGGGGGCGG	TITGCICACA	CTGATACCGC	AATACGCAAA	TGGAAAGCGG
GCCCTAGCGC	CTCTAAATCG	TTAGGGTGAT	ACGITCITIA	ATTTATAAGG	GAATTTTAAC	TTTGTTTATT	ATAATATTGA	TTTTGCCTTC	CACGAGTGGG	TTTTCCAATG	GAGCAACTCG	ATCTTACGGA	CAACTTACTT	GTAACTCGCC	TGCCTGTAGC	ACAATTAATA	TGGTTTATTG	ATGGTAAGCC	ACAGATCGCT	CTTTAGATTG	TGACCAAAAT	TTCTTGAGAT	GTTTGTTTGC	CAAATACTGT	CCTCGCTCTG	TCAAGACGAT	TGGAGCGAAC	AGGGAGAAAG	GGGGGAAACG	GATGCTCGTC	TTGCTGGCCT	TTTGAGTGAG	AAGAGCGCCC	GTTTCCCGAC
ACTTGCCAGC	CCCCGTCAAG	AAAAACTTGA	GTTGGAGTCC	TATTCTTTG	AATTTAACGC	GGAACCCCTA	AAATGCTTCA	TTTTGCGGCA	CAGTTGGGTG	CCGAAGAACG	CGCCGGGCAA	ACAGAAAAGC	ACACTGCGGC	GGGGGATCAT	GACACCACGA	CTTCCCGGCA	TCCGGCTGGC	CTGGGGCCAG	AACGAAATAG	CTCATATATA	GATAATCTCA	TCAAAGGATC	ACCAGCGGTG	GCGCAGATAC	CGCCTACATA	CGGGTTGGAC	CAGCCCAGCT	CGCTTCCCGA	GGAGCTTCCA	CGATTTTTGT	TCCTGGCCTT	TATTACCGCC	GAGGAAGCGG	GGCACGACAG
TGACCGCTAC	CGCCGGCTTT	CTCGACCCCA	GCCCTTTGAC	TATCTCGGTC	ATTTAACAAA	AAATGTGCGC	TAACCCTGAT	TIATICCCIT	TGCTGAAGAT	AGTTTTCGCC	CCCGTATTGA	CTCACCAGTC	ATGAGTGATA	TGCACAACAT	CGACGAGCGT	CTTACTCTAG	GCTCGGCCCT	CATTGCAGCA	ACTATGGATG	ACCAAGTTTA	GATCCTTTTT	GTAGAAAGA	AACCACCGCT	CTTCAGCAGA	TCTGTAGCAC	CGTGTCTTAC	TICGIGCACA	GAAAGCGCCA	AGCGCACGAG	ACTTGAGCGT	TTTTTACGGT	TGGATAACCG	GTCAGTGAGC	TAATGCAGCT
ACGCGCAGCG	TCGCCACGTT	TTTACGGCAC	ACGGTTTTTC	CACTCAACCC	AAATGAGCTG	CTTTTCGGGG	CATGAGACAA	CGTGTCGCCC	AAGTAAAAGA	GATCCTTGAG	GCGGTATTAT	TGGTTGAGTA	TGCCATAACC	ACCGCTTTTT	CCATACCAAA	TGGCGAACTA	CCACTTCTGC	CICGCGGIAI	GAGTCAGGCA	TAACTGTCAG	TCTAGGTGAA	GTCAGACCCC	CAAACAAAAA	AGGTAACTGG	CTTCAAGAAC	GGCGATAAGT	GAACGGGGGG		GGAACAGGAG			CCTGATTCTG	AGCGCAGCGA	GCCGATTCAT
TGTGGTGGTT	CCTTCCTTTC	GATTTAGTGC	GCCCTGATAG	ACTGGAACAA	ATTGGTTAAA	TTAGGTGGCA	TGTATCCGCT	TCAACATTTC	ACGCTGGTGA	ACAGCGGTAA	GCTATGTGGC	CAGAATGACT	TATGCAGTGC	GAAGGAGCTA	CTGAATGAAG	AACTATTAAC	AGTTGCAGGA	GAGCGTGGGT	ACACGACGGG	TAAGCATTGG	TTTAAAAGGA	TCCACTGAGC	CTGCTGCTTG	CTTTTTCCGA	TAGGCCACCA	TGCTGCCAGT	CGGTCGGGCT	ACCTACAGCG	CGGCAGGGTC	GTCGGGTTTC	AAAACGCCAG	TGCGTTATCC	CGAACGACCG	ccececerre
1471	54	61		75	82	1891	96	03	10	17	24	31	38	45	52	2591	99	73	80	87	94	01	08	12	22	3291	36	43	20	57	64	71	3781	8

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ACTITIATECT TGACCATGAT	XhoI	111111111111111111111111111111111111111	CTCGAGGTCA	GTCAAAAGTG	AAATTTACTC	TGAATTGGTT	TGCTTTTGTA	TTTTTGAGAA AAATATATAT			GTTGCAGCGA	CCCCTAAAGT	AACCCACCC	CACCGCACGT	CGGGTCGTGG	AAAGAAACGC	ACCACCACCA	CCGGTAACCA	CTTGGTAGTT	GCTGGCGTCT			TCTTTCTTCT	TGTGACAAAT	
TTAGGCACCC CAGGCTTTAC ACTTTATGCT TTTCACACAG GAAACAGCTA TGACCATGAT		į	ವವವವವಾಶಕಾವ	AGATTACCTG	GCCCAAAGTG	CATTTTGTA	TTAAGTTCGT	TTTGACATAA			GCTTGCCCCC	ACAAAAACAA	AACCCAACCC	TTGTCCGCAC	CAGGTGGGTC	CTCCGCTTCC	CCCTACCACC	TCCGCCGCCG	GATCTTTGGC	GGATCTCGCG	Bglii	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AGATCTTCTT	TTTCATGATT	
	KpnI	2 2 2 2 2	AGGGAACAAA AGCTGGGTAC CGGGCCCCCC	AACAAAGGTA	ATAAAAGGTG	TTTGATACGT	GAGTCGGTTT	CATATGCTAA			ACAATAATAA GATTAAAATA GCTTGCCCCC	CAAAACATTT	AGCCCAACCC	TCACCGTGAG	AGAAAAACAG	ರ್ವದಿಂದರಿಕ್ಕರು	ATCCCCCCAA	CCCCTCCCC	TCTCGGTCTC	GGGAGGGGCG			TCTCGGATGT	TAGTTTTTCT	
AGCTCACTCA CGGATAACAA			AGGGAACAAA	TCCAAAATAA	AATATCGGTA	TTGTCGGTAC	ATCTGTATTT	TTAAAAAACC			ACAATAATAA	AACTTAGACT	TAGCAAGCCC	CCCGGCACTA	AAAAAGAAAA	GCGACGAGGC	CICICCICC	GAGCTCCTCC	TTTTTTCG	ATCGGTGCGC			GGAATGGGGC	TGTTCATCGG	
AATGTGAGTT GAATTGTGAG			GCGCAATTAA CCCTCACTAA	GTCGGGATAG	GTATAAGTAA	TGAGGATGTT	GGAAATGCAT	AGAAATATCT		2 2	TCCACAATGA	ATAAAAGATA	GCACGATCCA	AGTCTCCACC	AAGAAAGAAA	ATCGCGAGCA	ATACCCCCC	GCCGGACGAC	TTTCTCCGTT	CGTCGCCCAG	HI	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ATCCTCGCGG	CCCTCAGCAT	TTTGTAGC
CAACGCAATT ATGTTGTGTG			GCGCAATTAA	TGAGAAGAGA GI	TTAAAAGGTG	TTATAAAAT	TTCGCGATTT GO	GATTTGTATA AGAAATATCT	ECORI	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	TCAGGCGAAT	TTCTAGTAAA AT		ACTGGCAAAT	AAAAAAAAA	AGCGAGGAGG	CACTATATAC	CCCCTCGCT	CICCICILIC	AGAGCGGCTT	BamHI	1 1 1	GTCGCCCGG ATCCTCGCGG	GAATTTGAAT CCCTCAGCAT	GCGGAGCTTT TTTGTAGC
3921 3991			4061	4131	4201	4271	4341	4411			4481	4551	4621	69	4761	83	4901	4971	5041	5111			5181	5251	5321

### FIG.\_32E

### 40 / 154

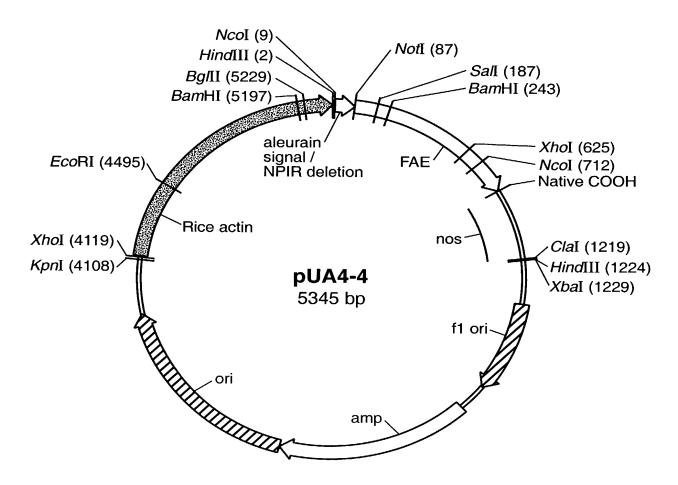


FIG.\_33A

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GGCCACGGCC GCCGTCGCC 4 H ď Н CICCIGGCGC ICGCCGIGCI 4 Ы CCGCGTCCTC pz; AAGCTTACCA Н

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TACAGCCGTT TAGTCGAAAT 闰 Н œ ល × CGAAGACCTC А 闰 AGGCATCTC H Ø ວວອອວອວອວວ TCGCCTCCTC Ŋ Ø 71

闰 Ö ß CCTGTGCAAC Z ບ BamHI А 4 4 O Ŋ GGCCACTATC H ⋖

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XhoI 딜 ស ß Ω GCAGGTTAGC T A CTCAAACTGA O Ø CCTACCACAA 211 281 351 421 491

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FIG.\_33B

"Manipulation of the Phenolic Acid Content and SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 42 of 154

42 / 154

CTTGCGATGA TTATCATATA ATTTCTGTTG TTTATGATTA GCATTAAGCG GCTCCCTTTA AGGAAGAGTA CATCGAACTG AGCACTTTTA GCCGCATACA ACAACGATCG ATCGTTGGGA GGCAACAACG CCAGGGGGG CAGGGTGTGA ATAATGCGCA CACGACTTAT TTTCAGCCTC CCCGAGTGTA CCAGGAAGA AATATAGCGC GCAAACTAGG ATAAATTATC TCACGTAGTG CTAAATACAT TTTTTGCTCA CATGACAGTA ATAAATCTGG GTTCAAACAT Gregaecrec Aarreseecr ACCCTGGCGT GGCCCGCACC CTCCTTTCGC TTTGCCGATT ATATTAACGC GTGGACTCTT CGTTATTTAT GAGATGGGTT GAAGCAGATC GACTGGGAAA ATAGCGAAGA CTGTAGCGGC CTAGCGCCCG TAAATCGGGG GGGTGATGGT TTCTTTAATA TATAAGGGAT TTTTAACAAA ATATTGAAAA TGCCTTCCTG GAGTGGGTTA TCCAATGATG CAACTCGGTC TTACGGATGG CTTACTTCTG ACTCGCCTTG CTGTAGCAAT TTTATTGCTG GTTTATTTT ATTAATAGAC GAGCTGTAAA TACTAGATCG ATAAGCTTCT AGAGCGGCCG AGCTGGCGTA TGCTTCAATA GGATCATGTA ACAACGTCGT GGGACGCGCC CGTCAAGCTC AACTTGATTA GGAGTCCACG TTAACGCGAA CGGGCAAGAG CTGCGGCCAA ACCACGATGC CCCGGCAACA GGCTGGCTGG TGCCAGCGCC TCTTTTGATT ACCCCTATT TGCGGCATTT TTGGGTGCAC AAGAACGTTT GAAAAGCATC CCGTCGTTTT CCCTTTCGCC TITGGGATGA CGAGCGGAGC CTGTACATGG TGATCAGTCA SAGTCCCGCA ATTATACATT TAATACGCGA TAGAAACAA GACCCCAAAA TGTGCGCGGA TTTCGCCCCG CGGCCCTTCC ACTGAAGGAT TGTTGCCGGT TAATGCATGA AATGGCGAAT CCGCTACACT CGGCTTTCCC CTCGGTCTAT TAACAAAAT CCCTGATAAA AGTGATAACA CTTTGACGTT TTCCCTTTTT TGAAGATCAG GTATTGACGC ACCAGTCACA ACAACATGGG CGAGCGTGAC ACTCTAGCTT HindIII 211111, GCGCAGCCTG CTTCTGCGCT CCGCGTAACC GATTGAATCC AATTACGTTA AGCATGTAAT AATTAACATG GTCGCCCTTA CATAACCATG GCTTTTTGC CGAACTACTT CGCTCACTGG CAGCACATCC CGCAGCGTGA TGAGCTGATT TTCGGGGAAA GAGACAATAA TAAAAGATGC CCTTGAGAGT TTGAGTACTC TACCAAACGA CCACGTTCGC ACGCCACCTC GTTTTTCGCC TCAACCCTAT GTATTATCCC IGGATGTCCT GGAGAGGGGG TTGGCAATAA AGTTTCTTAA TTAGTGCTTT GTATTACGCG AATCGCCTTG GGTGGTTACG TCCTTTCTCG CTGATAGACG ACATTTCCGT GCGGTAAGAT TCATCTATGT CCCAACAGTT GGAACAACAC GGTTAAAAA GGTGGCACTT ATCCGCTCAT CTGGTGAAAG ATGTGGCGCG AATGACTTGG GCAGTGCTGC GGAGCTAACC AATGAAGCCA TATTAACTGG TGCAGGACCA TACCCAACTT **IGAGTATTCA** SCGCGCGGTG GGGTTCCGAT **LTACAATTTA ICAAATATGT** CCAGAAACG SATCTCAACA AAGTTCTGCT CTATTCTCAG AGAGAATTAT SAGGACCGAA ACCEGAGCTG **LTGCGCAAAC** CGGATAAAGT ATAGTGAGTC SATCGCCCTT CGCGGGTGT PTTCTTCCT GGCCATCGCC GTTCCAAACT TCGGCCTATT **∑** 911 981 1471 1541 1961 1051 1191 1261 1331 1401 1611 1681 1751 1821 1891 2031 2101 2171 2241 2311 2381 2451 2521 2591 1121

AGGGGTACGC CCATGGCGGT GTAGAGTACT GGAGCGTTGA TCCTTACAGC GCCCAGAACA CATTTGTCTG

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CCGTATCGTA ATAGGTGCCT	TAAAACTTCA	TTAACGTGAG	TTTTTTG	ATCAAGAGCT	TCTAGTGTAG	ATCCTGTTAC	TACCGGATAA	CTACACCGAA	GACAGGTATC	GGTATCTTTA	GGGCGGAGC	GCTCACATGT	ATACCGCTCG	ACGCAAACCG	AAAGCGGGCA	TTATGCTTCC	CCATGATTAC	i.	\$ 2	GAGGTCATTC	AAAAGTGAAA	TTTACTCTTT	ATTGGTTTTT	TTTTGTAAAT	TTGAGAAAAA		GCAGCGATGG	CTAAAGTCCT	CCACCCCAGI	CGCACGTCTC	GTCGTGGGGG	GAAACGCCCC
GTAAGCCCTC	TAGATTGATT	CCAAAATCCC	TTGAGATCCT	TGTTTGCCGG	ATACTGTCCT	CGCTCTGCTA	AGACGATAGT	AGCGAACGAC	GAGAAAGGCG	GGAAACGCCT	GCTCGTCAGG	CIGGCCITIL	GAGTGAGCTG	AGCGCCCAAT	TCCCGACTGG	GCTTTACACT	ACAGCTATGA	Xho	1 1 1	GCCCCCCCTC	TTACCTGGTC	CAAAGTGAAA	TTTTGTATGA	AGTTCGTTGC	GACATAATTT		TGCCCCCGTT	AAAACAACCC	CCAACCCAAC	TCCGCACCAC	GTGGGTCCGG	CGCTTCCAAA
GGGCCAGATG	ATATATACTT	AATCTCATGA	AAGGATCTTC	AGCGGTGGTT	CAGATACCAA	CTACATACCT	GTTGGACTCA	CCCAGCTTGG	TTCCCGAAGG	GCTTCCAGGG	TTTTGTGAT	TGGCCTTTTG	TACCGCCTTT	GAAGCGGAAG	ACGACAGGTT	GGCACCCCAG	CACACAGGAA	KpnI	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TGGGTACCGG	AAAGGTAAGA	AAAGGTGGCC	GATACGTCAT	TCGGTTTTTA	ATGCTAATTT		TAAAATAGCT	AACATTTACA	CCAACCCAAC	CCGTGAGTTG	AAAACAGCAG	GCCCTCCCTC
TGCAGCACTG ATGGATGAAC	AAGTTTACTC	CCTTTTTGAT	GAAAAGATCA	CACCGCTACC	CAGCAGAGCG	GTAGCACCGC	GTCTTACCGG	GTGCACACAG	AGCGCCACGC	GCACGAGGGA	TGAGCGTCGA	TTACGGTTCC	ATAACCGTAT	AGTGAGCGAG	TGCAGCTGGC	TCACTCATTA	ATAACAATTT			GAACAAAAGC	AAAATAAAAC	ATCGGTAATA	TCGGTACTTT	TGTATTTGAG	AAAAACCCAT		ATAATAAGAT	TTAGACTCAA	CAAGCCCAGC	GGCACTATCA	AAGAAAAGA	ACGAGGCCCG
GCGGTATCAT	CTGTCAGACC	AGGTGAAGAT	AGACCCCGTA	ACAAAAAAC	TAACTGGCTT	CAAGAACTCT	GATAAGTCGT	CGGGGGGTTC	GCTATGAGAA	ACAGGAGAGC	ACCTCTGACT	CGCGGCCTTT	GATTCTGTGG	GCAGCGAGTC	GATTCATTAA	GTGAGTTAGC	TTGTGAGCGG			TCACTAAAGG	GGGATAGTCC	TAAGTAAAAT	GGATGTTTTG	AATGCATATC	AATATCTTTA		ACAATGAACA	AAAGATAAAC	CGATCCATAG	CTCCACCCC	AAAGAAAAA	GCGAGCAGCG
CGTGGGTCTC	GCATTGGTAA	AAAAGGATCT	ACTGAGCGTC	CTGCTTGCAA	TTTCCGAAGG	GCCACCACTT	TGCCAGTGGC	TCGGGCTGAA	TACAGCGTGA	CAGGGTCGGA	GGGTTTCGCC	ACGCCAGCAA	GTTATCCCCT	ACGACCGAGC	CGCGTTGGCC	CGCAATTAAT	TTGTGTGGAA			CAATTAACCC	GAAGAGAGTC	AAAGGTGGTA	TAAAAATTGA	GCGATTTGGA	TTGTATAAGA	2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	GGCGAATTCC	TAGTAAAATA	GTGCTATGCA	GGCAAATAGT	AAAAAAAAG	GAGGAGGATC
AGCCGGTGAG GTTATCTACA	CACTGATTAA	TTTTAATTT	TTTTCGTTCC	GCGTAATCTG	ACCAACTCTT	CCGTAGTTAG	CAGTGGCTGC	GGCGCAGCGG	CTGAGATACC	CGGTAAGCGG	TAGTCCTGTC	CTATGGAAAA	TCTTTCCTGC	CCGCAGCCGA	CCTCTCCCCG	GTGAGCGCAA	GGCTCGTATG			GCCAAGCGCG	ATATGCTTGA	ACATCAGTTA	TCTACTATTA	AAGTTTATTC	ACAGAGGGAT		TATATATTCA	GTATTTTTC	AAAGCCCAAA	GCAGCCAACT	GCAGCCAAAA	CCGGAAAAGC
2731 2801	2871	94	01	08	15	22	29	36	43	50	57	64	71	78	85	92	99			9	4131	0	~	34	$\vdash$		$\infty$	Ŋ	62	69	4761	7)

# FIG.\_33D

"Manipulation of the Phenolic Acid Content and SN# 09/991,209, Dunn-Coleman et al. Docket No. GC648-2 Sheet 44 of 154

44 / 154

TCAGCATTGT TCATCGGTAG TTTTTCTTTT CATGATTGT GACAAATGCA CGGATGTAGA TCTTCTTTCT TTCTTCTTT AGGGCGGGA TCTCGCGGCT 11111 CGGTCTCGAT GGTGCGCGGG GGCCCGGATC CTCGCGGGGA ATGGGGCTCT TTTTTCGTCT CTCCGTTTTT CGCCCAGATC GCCTCGTGCG GAGCTTTTTT GTAGC

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BamHI

TTTGAATCCC

TGTGGTAGAA GGCGTGAGTC

5181 5251 5321

GCGGCTTCGT

CTCTTTCTTT CCTCGCTGCC

CICCCCCTCC GCCGCCGC GIAACCACCC CCCCCAACCC TACCACCACC ACCACCACA

TCCTCCCATC CICCICCCC

GGACGACGAG

CCCCCCCTC

TATATACATA

CCATCGCCAC CCTCCTCCCC CGCCCCTCTC GTGGGCGAGA

> 4971 5041 5111

CTTTGGCCTT

GGTAGTTTGG GGCGTCTCCG

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

Expression of Genes Encoding Cell Wall...

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 45 of 154

### 45 / 154

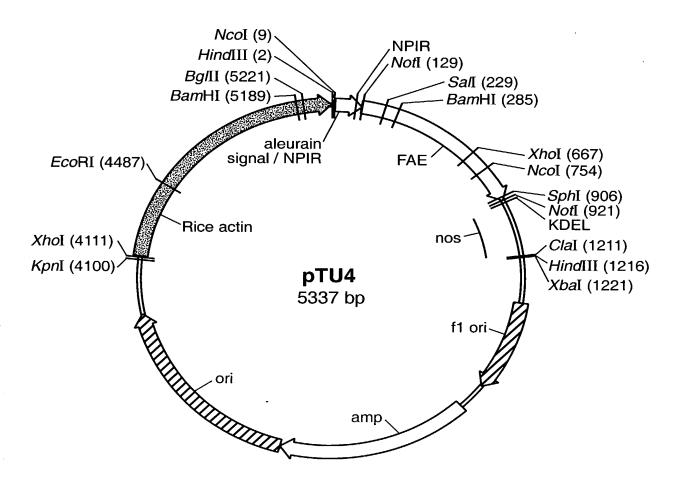


FIG.\_34A

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"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No GC648-2

Sheet 46 of 154

46 / 154

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GGCCACGGCC GCCGTCGCCG ⋖ H 4 CICCIGGCGC ICGCCGIGCI Н > ď Н ď Н CCGCGTCCTC TGGCCCACGC AAGCTTACCA Н

TTTAGTCGAA ATGGCCACTA TCTCCCAAGC TGCCTACGCC Ø GACCGCGCGG Ŋ Ω GCCCGTCACC Н > щ Σ ACCCGATCCG 吆 н щ z TCCGAAGACC TCTACAGCCG GCCGACTCCA വ А ď ល ល GCAGGGCATC Ø TCGCCTCCTC Ø Ö ď 141

GACATTAACG Н A TTCTCAAACT H Ot Ø GACTATTATC AAGGGAGAGA AAATTTACAA Z × Н × 闰 G н GACCTGTGCA ACATTCCGTC z ບ BamHI Н А 211

CCTCGGCGCC TCCCTGGCGG CACTCACTGC GCCTTTCGAC ACCCTACCAC AATGCAACGG GCTTGTCAAA Ö H ບ Ö CACGGTGGAT ATTATATTGG ATGGGTCTCC GTCCAGGACC AAGTCGAGTC 臼 Ö O CCGCGACGAC AGCAGCAAAG AAATAATCAC CTGACCGTGA CCGGCCACKC O! Ö GATACTAACT ACACCCTCAC E ស GGACTACGCG А GATGGATCCT TCTACAACTC i O Ö 3 281 351 421 491

TCTGCGACAT ACGACAACAT CCGCCTGTAC ACCTTCGGCG AACCGCGCAG CGGCAATCAG Ö щ 闰 Н XhoI CGCCCAGCTG O Li 561

GACGCAGTAT Q CAAGCCTCGA GCCCAGATAC А Д Ø CGATGCCTTC 4 CGTACATGAA Σ ល

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FIG.\_34B

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted" Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 47 of 154

47 / 154

TTTTTATGAT TAGAGTCCCG GATAGAAAAC AAAATATAGC GCGCAAACTA GGATAAATTA TCGCGCGGG GCCCAGGGCG GACAGGGTGT GAATAATGCG CACACGACTT ATTTTGGGAT GACGAGCGGC GCATGCACCT CTCATGCCAA CGACGGCATC CCAAACCTGC CCCGGTGGA GCAGGGGTAC GCCCATGGCG GTGTAGAGTA  $\cdot$  W S V D P Y S A Q N T F V C T G D E V Q C ECTGGAGCGTT GATCCTTACA GCGCCCAGAA CACATTTGTC TGCACTGGGG ATGAAGTGCA GTGCTGTGAG TCGTTCAAAC ATTTGGCAAT TGAATTACGT ບ Sphi 1211 ø TAATTTCTGT O Ŋ H TGTAATGCAT GACGTTATTT ATGAGATGGG CCACTGAAGG ATGAGCTGTA AAGAAGCAGA GATTATCATA Z Ċ **[**24 × CCTGTTGCCG GTCTTGCGAT ۲ Ы H 闰 Ħ A 4 L R Z щ TAAGCATGTA ATAATTAACA GGCCGGTCGC GGCCGCGAA AAAGTTTCTT AAGATTGAAT CAATTATACA TTTAATACGC 闰 Ö 4 O ט ט 841 1051 1121 771

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HindIII

ATTCAAATAT TATGAGTATT CACCCAGAAA TGGATCTCAA TAAAGTTCTG TAAGAGAATT CGGAGGACCG TAGGGTTCCG TGGGCCATCG TTTCGGCCTA GCTTACAATT CACTATICIC CGCGGCGGGT GCTTTCTTCC TTGTTCCAAA CTATAGTGAG CCGATCGCCC GTTACCCAAC TGAGCACTTT GGCATGACAG TGACAACGAT ATTTTGCCGA AAAGGAAGAG TGTTTTTGCT TACATCGAAC TCGCCGCATA TAGTGGACTC TTCTAAATAC CGCTCCTTTC GGGCTCCCTT GTTCACGTAG AAATATTAAC CCAATTCGCC AAACCCTGGC GAGGCCCGCA GCGCATTAAG GCCATAACCA TGAGTGATAA CACTGCGGCC AACTTACTTC AGCAACTCGG TCTTACGGAT TTTATAGGG AATTTTAACA TAATATTGAA TTTCCAATGA CGTTCTTTAA TTTGCCTTCC ACGAGTGGGT CGGTGGAGCT GTGACTGGGA TTGTTTTTT CCCTGTAGCG CCCTAGCGCC TCTAAATCGG TAGGGTGATG TAATAGCGAA GCCGGGCAAG TTTAACAAAA ATTTAACGCG GAACCCCTAT AACCCTGATA AATGCTTCAA TATTCCCTTT TTTGCGGCAT GCTGAAGATC AGTTGGGTGC CGAAGAACGT CAGAAAAGCA ATTCTTTGA GTTACTAGAT CGATAAGCTT CTAGAGCGGC CCAGCTGGCG CTTGCCAGCG CCCGTCAAGC TCGACCCCAA AAAACTTGAT TTGGAGTCCA TTACAACGTC ATGGGACGCG ATCTCGGTCT AATGTGCGCG GTTTTCGCCC CCGTATTGAC TCACCAGTCA GGCCGTCGTT TGAATGGCGA CCCCCTTTCG GACCGCTACA GCCGGCTTTC CCCTTTGACG GGTTGAGTAC CGGTATTATC TGCAGCACAT TTGCGCAGCC CGCGCAGCGT AATGAGCTGA TTTTCGGGGA ATGAGACAAT GTGTCGCCCT AGTAAAAGAT ATCCTTGAGA CGCGCTCACT CGCCACGTTC TTACGGCACC ACTCAACCCT CGGTTTTTCG CGCTGGTGAA ATTTAGTGCT CTGGAACAAC TTGGTTAAAA GTATCCGCTC CAGCGGTAAG CTATGTGGCG AGAATGACTT ATGCAGTGCT TAGGTGGCAC CAACATTTCC TCGTATTACG TTAATCGCCT TTCCCAACAG GTGGTGGTTA CTTCCTTTCT CCCTGATAGA TGTCATCTAT 2031 2101 2171 2241 1331 1401 1471 1541 1611 1681 1751 1821 1891 1961 2311 1261 1191

48 / 154

GAACCGGAGC	GGCGGATAAA	GGAGCCGGTG	TAGTTATCTA	CTCACTGATT	CATTTTAAT	AGTTTTCGTT	GCGCGTAATC	CTACCAACTC	AGCCGTAGTT	ACCAGTGGCT	AAGGCGCAGC	AACTGAGATA	TCCGGTAAGC	TATAGTCCTG	GCCTATGGAA	GTTCTTTCCT	CGCCGCAGCC	CGCCTCTCCC	CAGTGAGCGC	CCGGCTCGTA	ACGCCAAGCG			TCATATGCTT	AAACATCAGT	TTTCTACTAT	TTAAGTTTAT	ATACAGAGGG	AATATATT			GGGTATTTT CTAAAGCCCA
TGATCGTTGG	ACTGGATGGA	TGATAAATCT	TCCCGTATCG	AGATAGGTGC	TTTAAAACTT	CCTTAACGTG	CTTTTTTCT	GGATCAAGAG	CTTCTAGTGT	TAATCCTGTT	GTTACCGGAT	ACCTACACCG	CGGACAGGTA	CTGGTATCTT	GGGGGCGGA	TTGCTCACAT	TGATACCGCT	ATACGCAAAC	GGAAAGCGGG	CTTTATGCTT	GACCATGATT	XhoI	****	TCGAGGTCAT	TCAAAAGTGA	AATTTACTCT	GAATTGGTTT	GCTTTTGTAA	TTTTGAGAAA			TTGCAGCGAT
TAACTCGCCT	CAATTAATAG	GGTTTATTGC	TGGTAAGCCC	CAGATCGCTG	TTTAGATTGA	GACCAAAATC	TCTTGAGATC	TTTGTTTGCC	AAATACTGTC	CTCGCTCTGC	CAAGACGATA	GGAGCGAACG	GGGAGAAAGG	GGGGAAACGC	ATGCTCGTCA	TGCTGGCCTT	TTGAGTGAGC	AGAGCGCCCA	TTTCCCGACT	AGGCTTTACA	AAACAGCTAT	~		ವವವವವವಾಶಕಾ	GATTACCTGG	CCCAAAGTGA	ATTTTTGTAT	TAAGTTCGTT	TTGACATAAT			CAPABACAAC
GGGGATCATG	TTCCCGGCAA	CCGGCTGGCT	TGGGGCCAGA	ACGAAATAGA	TCATATATAC	ATAATCTCAT	CAAAGGATCT	CCAGCGGTGG	CGCAGATACC	GCCTACATAC	GGGTTGGACT	AGCCCAGCTT	GCTTCCCGAA	GAGCTTCCAG	GATTTTTGTG	CCTGGCCTTT	ATTACCGCCT	AGGAAGCGGA	GCACGACAGG	TAGGCACCCC	TTCACACAGG	KpnI	1 2 2 2 2 2	GCTGGGTACC	ACAAAGGTAA	TAAAAGGTGG	TTGATACGTC	AGTCGGTTTT	ATATGCTAAT			ATTAAAATAG AAAACATTTA
GCACAACATG	TTACTCTAGC	CICGGCCCTI	ATTGCAGCAC	CTATGGATGA	CCAAGTTTAC	ATCCTTTTTG	TAGAAAAGAT	ACCACCGCTA	TTCAGCAGAG	CTGTAGCACC	GTGTCTTACC	TCGTGCACAC	AAAGCGCCAC	GCGCACGAGG	CTTGAGCGTC	TTTTACGGTT	GGATAACCGT	TCAGTGAGCG	AATGCAGCTG	GCTCACTCAT	GGATAACAAT			GGGAACAAAA	CCAAAATAAA	ATATCGGTAA	TGTCGGTACT	TCTGTATTTG	TAAAAAACCC			CAATAATAAG
CCGCTTTTTT	GGCGAACTAC	CACTTCTGCG	TCGCGGTATC	AGTCAGGCAA	AACTGTCAGA	CTAGGTGAAG	TCAGACCCCG	AAACAAAAA	GGTAACTGGC	TTCAAGAACT	GCGATAAGTC	AACGGGGGGT	GAGCTATGAG	GAACAGGAGA	CCACCTCTGA	AACGCGGCCT	CTGATTCTGT	GCGCAGCGAG	CCGATTCATT	ATGTGAGTTA	AATTGTGAGC			CCTCACTAAA	TCGGGATAGT	TATAAGTAAA	GAGGATGTTT	GAAATGCATA	GAAATATCTT		· · · · · · · · · · · · · · · · · · ·	CCACATGAA TAAAAGATAA
AAGGAGCTAA TGAATGAAGC	ACTATTAACT	GTTGCAGGAC	AGCGTGGGTC	CACGACGGGG	AAGCATTGGT	TTAAAAGGAT	CCACTGAGCG	TGCTGCTTGC	TTTTCCGAA	AGGCCACCAC	GCTGCCAGTG	GGTCGGGCTG	CCTACAGCGT	GGCAGGGTCG	TCGGGTTTCG	AAACGCCAGC	GCGTTATCCC	GAACGACCGA	CGCGCGTTGG	AACGCAATTA	TGTTGTGG			CGCAATTAAC	GAGAAGAGAG	TAAAAGGTGG		TCGCGATTTG	ATTTGTATAA	ECORI	7	CAGGCGAATT
2451 2521	σ	99	73	80	87	94	0	08	15	22	29	36	43	20	57	64	71	78	82	92	9			4061	ന	2		S	4411		9	4551

# FIG.\_34D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 49 of 154

49 / 154

GAATGGGGCT CTCGGATGTA GATCTTCTTT CTTTCTTCTT TTTGTGGTAG AATTTGAATC CCTCAGCATT GTTCATCGGT AGTTTTTCTT TTCATGATTT GTGACAAATG CAGCCTCGTG TCGCAGCCAA GGCCGGAAAA CCCCATCGCC CACCTCCTCC CCCGCCCTC GGGTGGGCGA CGGGCGTGAG GCCCAACCCA ACCCAACCCA ACCCACCCCA ACCGCACGTC GGGTCGTGGG AAGAAACGCC CCACCACCAC CGGTAACCAC TTGGTAGTTT CTGGCGTCTC TGTCCGCACC GGAGGGCGG GATCTCGCGG TCCGCTTCCA CCTACCACCA CTCGGTCTCG ATCTTTGGCC AGGTGGGTCC 2022022022 GAAAAACAGC CGGCCCTCCC CCCTCCCCT CACCGTGAGT TCCCCCCAAC AAGTGCTATG CACGATCCAT AGCAAGCCCA CCGGCACTAT TCTCCTCCCA AGCTCCTCCC TTTTTTCGT GAGCGGCTTC GTCGCCCAGA TCGGTGCGCG AAAAGAAAA CGACGAGGCC AAAAAAAA AGAAAGAAAA CCCCTCGCTG CCGGACGACG TCCTCTTTCT TTCTCCGTTT TCGGCCCGGA TCCTCGCGGG GTCTCCACCC GCGAGGAGGA TCGCGAGCAG ACTATATACA TACCCCCCC CGGAGCTTTT TTGTAGC BamHI CTGGCAAATA 5251 4691 4761 4831 4901 4971 5181 5321 5041 5111

GTGCAGCCAA

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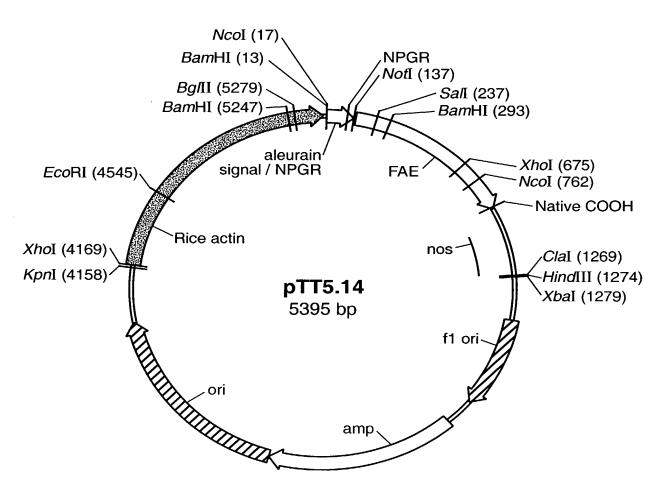


FIG.\_35A

### 51 / 154

CCACGGCCGC H GCCGTGCTGG CCGTCACCGA > ď CCTGGCGCTC 2002200022 Н ø Ö Н CCTGACGCCG AGGATCCATG GCCCACGCCC GCGTCCTCT Н CGACTCCAAC Z ß > ĸ ď K, 耳 ß Ŋ ល 4 CGTCGCCGTC > ď NotI Н 71

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O 闰 TACAGCCGTT CGAAGACCTC Ç 141

Ø 闰 Ö U

CCTGTGCAAC BamHI 211

TTGTCAAACA Ö H GTCGAGTCGC TCGGCGCCTC CTTCGGCGAA Ö œ Ö Ēų GGCCACKCCC GACAACATCC GCCTGTACAC XhoI GACCGTGACC ĸ CAGTATCCGG ACTACGCGCT TGCGACATAC TATATTGGAT ß Ω ĸ CGGTGGATAT CICACIGCCG CCCAGCIGIC 3 GTGAAGTACA GATACGAATC GCAGGTTAGC CATTAACGGA Ç Z 281 351 421 561 491

CGCAGTATTT NCOL O CCAGATACGA А μ AGCCTCGAGC ល ß O ď А z Σ CTTCGCGTCG ß ď <u>F4</u> GCAATCAGGC ď O Z 631

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# FIG.\_35B

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted To The Total Content and Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 52 of 154

52 / 154

GTAGAGTACT GGAGCGTTGA TCCTTACAGC GCCCAGAACA CATTTGTCTG CACTGGGGAT GAAGTGCAGT ATTICIGITG AATTACGITA AGCATGIAAT ATTATACATT GGAACAACAC GGTTAAAAAA CTGGTGAAAG GCGGTAAGAT ATGTGGCGCG AATGACTTGG GCAGTGCTGC GGAGCTAACC TATTAACTGG TGCAGGACCA SCIGIGAGGC CCAGGGCGGA CAGGGIGIGA ATAAIGCGCA CACGACIIAI ITIGGGAIGA CGAGCGGAGC TGGATGTCCT GGAGAGGGGG GCGCGCGGTG TCATCTATGT GTATTACGCG AATCGCCTTG GGTGGTTACG TCCTTTCTCG TTAGTGCTTT CTGATAGACG GGTGGCACTT ATCCGCTCAT ACATTTCCGT TIGGCAATAA AGTITCTTAA CCCAACAGTT o\* > = GAGTCCCGCA TTACAATTTA TCAAATATGT TGAGTATTCA GATCTCAACA AAGTTCTGCT CTATTCTCAG ACCGGAGCTG GATCGCCCTT TTTCTTCCT GGGTTCCGAT TCGGCCTATT CCCAGAAACG AGAGAATTAT GAGGACCGAA TTGCGCAAAC CGGATAAAGT ATAGTGAGTC TACCCAACTT CGGCGGGTGT GGCCATCGCC GTTCCAAACT ט TITCAGCCIC CCCGAGIGIA CCAGGAAGA GTTCAAACAT AATATAGCGC GCAAACTAGG ATAAATTATC AGCACTTTTA CATGACAGTA ATCGTTGGGA GGCAACAACG TGGATGGAGG TTTATGATTA CATCGAACTG GCCGCATACA ACAACGATCG AATTCGCCCT ACCCTGGCGT TCACGTAGTG TTTGCCGATT ATATTAACGC CTAAATACAT AGGAAGAGTA TTTTTGCTCA GGCCCGCACC GCATTAAGCG CTCCTTTCGC GCTCCCTTTA GTGGACTCTT F V TTATCATATA GACTGGGAAA TTTTAACAAA ATATTGAAAA TCCAATGATG CTTACTTCTG GGATCATGTA ACTCGCCTTG CCCGCCAACA ATTAATAGAC Q G V N N A H GTGGAGCTCC TATAAGGGAT TGCCTTCCTG GAGTGGGTTA TTACGGATGG CTGTAGCAAT GAAGCAGATC GAGATGGGTT ATAGCGAAGA CTGTAGCGGC CTAGCGCCCG TAAATCGGGG GGGTGATGGT TTCTTTAATA GTTTATTTT CAACTCGGTC TGCTTCAATA TGCGGCATT GAAAAGCATC CTGCGGCCAA CTTGCGATGA CGTTATTTAT TACTAGATCG ATAAGCTTCT AGAGCGGCCG AGCTGGCGTA CGTCAAGCTC GGAGTCCACG TCTTTTGATT TTAACGCGAA ACCCCTATT AAGAACGTTT CGGGCAAGAG ACCACGATGC GAGCTGTAAA ACAACGTCGT GGGACGCGCC TGCCAGCGCC AACTTGATTA TTGGGTGCAC CCGTCGTTTT TTTCGCCCCG TGTTGCCGGT TAATACGCGA TAGAAAACAA CCCTTTCGCC AATGGCGAAT CCGCTACACT TAACAAAAT TGTGCGCGGA CTGTACATGG TGATCAGTCA CGGCTTTCCC GACCCCAAAA CTCGGTCTAT CCCTGATAAA TTCCCTTTTT TGAAGATCAG GTATTGACGC ACCAGTCACA AGTGATAACA CGAGCGTGAC ACTCTAGCTT SVD ACTGAAGGAT TAATGCATGA CTTTGACGTT ACAACATGGG ⋈ CATAACCATG CGCTCACTGG CAGCACATCC SCGCAGCCTG TCAACCCTAT TGAGCTGATT GTCGCCCTTA CCTTGAGAGT TTGAGTACTC SCTTTTTGC PACCAAACGA CGAACTACTT C E C CCCCTAACC SATIGAAICC AATTAACATG CGCAGCGTGA CCACGTTCGC ACGCCACCTC GTTTTTCGCC **TTCGGGGAAA** GAGACAATAA TAAAGATGC GTATTATCCC , C 闰 771 841 1681 1821 1891 1961 2101 2171 2241 2311 2381 2451 2521 981 1051 1331 1401 1471 1541 1611 1751 2031 1121 1191

CCGGGTCACT CATGCCAACG ACGGCATCCC AAACCTGCCC CCGGTGGAGC AGGGGTACGC CCATGGCGGT

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# FIG.\_35C

53 / 154

CGTGGGTCTC	GCATTGGTAA	AAAAGGATCT	ACTGAGCGTC	CTGCTTGCAA	TTTCCGAAGG	GCCACCACTT	TGCCAGTGGC	TCGGGCTGAA	TACAGCGTGA	CAGGGTCGGA	GGGTTTCGCC	ACGCCAGCAA	GTTATCCCCT	ACGACCGAGC	CGCGTTGGCC	CGCAATTAAT	TTGTGTGGAA	CAATTAACCC			GAAGAGAGTC	AAAGGTGGTA	TAAAAATTGA	GCGATTTGGA	TTGTATAAGA	ECORI	ş	GGCGAATTCC	TAGTAAAATA	GTGCTATGCA	GGCAAATAGT	AAAAAAAAG	GAGGAGGATC
AGCCGGTGAG GTTATCTACA	CACTGATTAA	TTTTAATTT	TTTTCGTTCC	GCGTAATCTG	ACCAACTCTT	CCGTAGTTAG	CAGTGGCTGC	GGCGCAGCGG	CTGAGATACC	CGGTAAGCGG	TAGTCCTGTC	CTATGGAAAA	TCTTTCCTGC	CCGCAGCCGA	CCICICCCCG	GTGAGCGCAA	GGCTCGTATG	GCCAAGCGCG			ATATGCTTGA	ACATCAGTTA	TCTACTATTA	AAGTTTATTC	ACAGAGGGAT			TATATATTCA	GTATTTTTC	AAAGCCCAAA	GCAGCCAACT	GCAGCCAAAA	CCGGAAAAGC
ATAAATCTGG CCGTATCGTA	ATAGGTGCCT	TAAAACTTCA	TTAACGTGAG	TTTTTCTGC	ATCAAGAGCT	TCTAGTGTAG	ATCCTGTTAC	TACCGGATAA	CTACACCGAA	GACAGGTATC	GGTATCTTTA	GGGCGGAGC	GCTCACATGT	ATACCGCTCG	ACGCAAACCG	AAAGCGGGCA	TTATGCTTCC	CCATGATTAC	ĭ	2 2	GAGGTCATTC	AAAAGTGAAA	TTTACTCTTT	ATTGGTTTTT	TTTTGTAAAT			TTGAGAAAAA	GCAGCGATGG	CTAAAGTCCT	CCACCCCAGT	CGCACGTCTC	GTCGTGGGGG
TTTATTGCTG GTAAGCCCTC	GATCGCTGAG	TAGATTGATT	CCAAAATCCC	TTGAGATCCT	TGTTTGCCGG	ATACTGTCCT	CGCTCTGCTA	AGACGATAGT	AGCGAACGAC	GAGAAAGGCG	GGAAACGCCT	GCTCGTCAGG	CTGGCCTTTT	GAGTGAGCTG	AGCGCCCAAT	TCCCGACTGG	GCTTTACACT	ACAGCTATGA	Xho	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	GCCCCCCCTC	TTACCTGGTC	CAAAGTGAAA	TTTTGTATGA	AGTTCGTTGC			GACATAATTT	TGCCCCCGTT	AAAACAACCC	CCAACCCAAC	TCCGCACCAC	GTGGGTCCGG
GGCTGGCTGG	GAAATAGACA	ATATATACTT	AATCTCATGA	AAGGATCTTC	AGCGGTGGTT	CAGATACCAA	CTACATACCT	GTTGGACTCA	CCCAGCTTGG	TTCCCGAAGG	GCTTCCAGGG	TTTTTGTGAT	TGGCCTTTTG	TACCGCCTTT	GAAGCGGAAG	ACGACAGGTT	GGCACCCCAG	CACACAGGAA	KpnI	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	TGGGTACCGG	AAAGGTAAGA	AAAGGTGGCC	GATACGTCAT	TCGGTTTTTA			ATGCTAATTT	TAAAATAGCT	AACATTTACA	CCAACCCAAC	CCGTGAGTTG	AAAACAGCAG
CGGCCCTTCC		AAGTTTACTC	CCTTTTTGAT	GAAAAGATCA	CACCGCTACC	CAGCAGAGCG	GTAGCACCGC	GTCTTACCGG	GTGCACACAG	AGCGCCACGC	GCACGAGGGA	TGAGCGTCGA	TTACGGTTCC	ATAACCGTAT	AGTGAGCGAG	TGCAGCTGGC	TCACTCATTA	ATAACAATTT			GAACAAAAGC	AAAATAAAAC	ATCGGTAATA	TCGGTACTTT	TGTATTTGAG			AAAAACCCAT	ATAATAAGAT	TTAGACTCAA	CAAGCCCAGC	GGCACTATCA	AAGAAAAAGA
CTTCTGCGCT		CTGTCAGACC	AGGTGAAGAT	AGACCCCGTA	ACAAAAAAC	TAACTGGCTT	CAAGAACTCT	GATAAGTCGT	CGGGGGGTTC	GCTATGAGAA	ACAGGAGAGC	ACCTCTGACT	CGCGGCCTTT	GATTCTGTGG	GCAGCGAGTC	GATTCATTAA	GTGAGTTAGC	TTGTGAGCGG			TCACTAAAGG	GGGATAGTCC	TAAGTAAAT	GGATGTTTTG	AATGCATATC			AATATCTTTA	ACAATGAACA	AAAGATAAAC	CGATCCATAG	CTCCACCCC	AAAGAAAAA
731	· +	2941	$\vdash$	_	_	3221	3291	3361	3431	3501	3571	3641	3711	3781	3851	3921	9	ဖ				0	7	4341	$\leftarrow$			4481	4551	62	4691	4761	4831

# FIG.\_35D

54 / 154

ACATA CTGCC TCTTT TTCGT	BamHI GGATC	ATCCC
TATAT CCTCG CTCTT	ວວວອອ	TTTGA GAGCT
CCATCGCCAC CCTCCTCCC CGCCCTCTC	GGCGTGAGTC	TGTGGTAGAA GCCTCGTGCG
ACGAGGCCCG GCCCTCCCTC CGCTTCCAAA GAAACGCCCC CCATCGCCAC TATATACATA TCCTCCCATC CCCCCAACCC TACCACCACC ACCACCAC CCTCCTCCCC CCTCGCTGCC CTCCTCCCC CTCCCCTCC GCCGCCGCG GTAACCACCC CGCCCCTCTC CTCTTTCTTT TTTTTCGTCT CGGTCTCGAT CTTTGGCCTT GGTAGTTTGG GTGGGCGAGA GCGGCTTCGT	Bamhi Banhi Bglii	ATGGGGCTCT CGGATGTAGA TCTTCTTTCT TTCTTCTTTT TGTGGTAGAA TTTGAATCCC TCATCGGTAG TTTTTCTTTT CATGATTTGT GACAAATGCA GCCTCGTGCG GAGCTTTTTT
CGCTTCCAAA TACCACCACC GCCGCCGCCG	TCTCGCGGCT	AGA TCTTCTTCT TTT CATGATTTGT
GCCCTCCCTC CCCCCAACCC CTCCCCTCC	AGGGGCGGGA TC Bglii	CGGATGTAGA TTTTTCTTTT
ACGAGGCCCG TCCTCCCATC CTCCTCCCCC	GGTGCGCGGG	ATGGGGCTCT TCATCGGTAG
GCGAGCAGCG CCCCCCCTC GGACGACGAG	CGCCCAGATC BamHI	~ CTCGCGGGGA TCAGCATTGT GTAGC
4901 4971 5041	5181	5251 5321 5391

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### 55 / 154

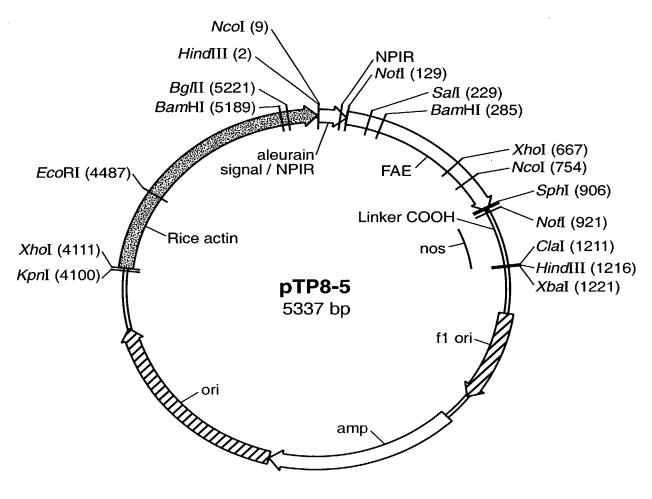


FIG.\_36A

56 / 154

ល GCCGTC ď NotI GGCCACGGCC GACCGCGCGG 4 4 H ល ď А TCGCCGTGCT GCCCGTCACC > ď Д Ы CTCCTGGCGC 吆 4 Н Д д Z CCGCGTCCTC TCCGAAGACC TCTACAGCCG GCCGACTCCA Д ស > Ω œ ď TGGCCCACGC 4 А I Ø 闰 Ø ស្ន AAGCTTACCA TCGCCTCCTC GCAGGCCATC ß വ Ö 4 O  $\leftarrow$ 141

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Z O Ŋ Z AAGGGAGAGA AAATTTACAA × ĸ 囯 Ö GACTATTATC H CCGTC ACATT Z GACCTGTGCA υ BamHI Н А 211

Ŋ Ö CCGCCTGTAC O Ö 闰 ATTATATIGG AIGGGICTCC TCTGCGACAT ACGACAACAT GATACTAACT ACACCCTCAC × H Ŋ ß А CACGGTGGAT TCTACAACTC GATGGATCCT Ö O O 3 561 281 351 421 491

ĸ GACGCAGTAT O GCCCAGATAC Д CAAGCCTCGA Ø CGATGCCTTC ď CGTACATGAA 631

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57 / 154

CTGGAGCGTT GATCCTTACA GCGCCCAGAA CACATTTGTC TGCACTGGGG ATGAAGTGCA GTGCTGTGAG TAGAGICCCG GCATGCACCT GCGCAAACTA GGATAAATTA TCGCGCGCGG TAGGGTTCCG TCGTTCAAAC ATTTGGCAAT TGAATTACGT CTATAGTGAG GTTACCCAAC CCGATCGCCC このこののこののこと GCTTTCTTCC TGGGCCATCG TTGTTCCAAA TTTCGGCCTA ATTCAAATAT TATGAGTATT CACCCAGAAA TGGATCTCAA TAAAGTTCTG CACTATTCTC TAAGAGAATT GCTTACAATT ပ Sphī GCCCAGGGCG GACAGGGTGT GAATAATGCG CACACGACTT ATTTTGGGAT GACGAGCGGC TAATTTCTGT TTTTTATGAT GCGCATTAAG GGGCTCCCTT GTTCACGTAG TAGTGGACTC TTCTAAATAC CCAATTCGCC GAGGCCCGCA CGCTCCTTTC ATTTTGCCGA AAATATTAAC AAAGGAAGAG TGTTTTTGCT TGAGCACTTT GGCATGACAG AAACCCTGGC TACATCGAAC TCGCCGCATA Ø H CCACTGAAGG ATGAGCTGTA AAGAAGCAGA ATGAGATGGG GATTATCATA CGGTGGAGCT GTGACTGGGA TTTATAGGG AATTTTAACA TAATATTGAA TCACCAGTCA CAGAAAAGCA TCTTACGGAT Z CCCTGTAGCG CCCTAGCGCC TCTAAATCGG TAGGGTGATG CGTTCTTTAA TTTGCCTTCC ACGAGTGGGT AGCAACTCGG TAATAGCGAA TTGTTTTTT TTTCCAATGA Ö Ēų TGTAATGCAT GACGTTATTT CCTGTTGCCG GTCTTGCGAT CAATTATACA TTTAATACGC GATAGAAAAC AAAATATAGC GITACTAGAT CGATAAGCTT CTAGAGCGGC ATTTAACGCG TTTGCGGCAT AGTTGGGTGC CGAAGAACGT GCCGGGCAAG TTACAACGTC CCAGCTGGCG ATGGGACGCG CTTGCCAGCG CCCGTCAAGC AAAACTTGAT TTGGAGTCCA ATTCTTTGA GAACCCCTAT AATGCTTCAA H H H HindIII TGAATGGCGA AACCCTGATA GGCCGTCGTT TTTAACAAAA CCCCCTTTCG GACCGCTACA TCGACCCCAA CCCTTTGACG ATCTCGGTCT GCTGAAGATC GTTTTCGCCC CCGTATTGAC GCCGGCTTTC AATGTGCGCG TATTCCCTTT 4 Z z GGCCGGTCGC GGCCGCGTAA TAAGCATGTA ATAATTAACA AAAGTTTCTT AAGATTGAAT CGCGCTCACT TGCAGCACAT TTGCGCAGCC CGCGCAGCGT CGCCACGTTC TTACGGCACC CGGTTTTTCG ACTCAACCCT AATGAGCTGA TTTTCGGGGA ATCCTTGAGA CGGTATTATC ATGAGACAAT GTGTCGCCCT AGTAAAGAT GGTTGAGTAC Ö 1111111111 O Noti ט 4 CGCTGGTGAA CAGCGGTAAG **PCGTATTACG** CTGGAACAAC PEGGTTAAAA PTAATCGCCT PTCCCAACAG GTGGTGGTTA CTTCCTTTCT ATTAGTGCT CCCTGATAGA GTATCCGCTC TATGTGGCG **IGTCATCTAT** TAGGTGGCAC CAACATTTCC AGAATGACTT .**U** O! 771 981 1051 1331 1471 1541 1751 1891 1261 1401 1611 1681 1821 1961 2031 1121 2101 2171 2311 2241

CTCATGCCAA CGACGGCATC CCAAACCTGC CCCCGGTGGA GCAGGGGTAC GCCCATGGCG GTGTAGAGTA

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## FIG.\_36C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 58 of 154

58 / 154

2381 2451	ATGCAGTGCT	GCCATAACCA	TGAGTGATAA	CACTGCGGCC	AACTTACTTC	TGACAACGAT	CGGAGGACCG
52	TGAATGAAGC	CATACCAAAC	GACGAGCGTG	ACACCACGAT	GCCTGTAGCA	ATGGCAACAA	CGTTGCGCAA
59	ACTATTAACT	GGCGAACTAC	TTACTCTAGC	TTCCCGGCAA	CAATTAATAG	ACTGGATGGA	GGCGGATAAA
99	GTTGCAGGAC	CACTTCTGCG	CICGGCCCTI	CCGGCTGGCT	GGTTTATTGC	TGATAAATCT	GGAGCCGGTG
73	AGCGTGGGTC	TCGCGGTATC	ATTGCAGCAC	TGGGGCCAGA	TGGTAAGCCC	TCCCGTATCG	TAGTTATCTA
80	CACGACGGGG	AGTCAGGCAA	CTATGGATGA	ACGAAATAGA	CAGATCGCTG	AGATAGGTGC	CTCACTGATT
87	AAGCATTGGT	AACTGTCAGA	CCAAGTTTAC	TCATATATAC	TTTAGATTGA	TTTAAAACTT	CATTTTAAT
94	TTAAAAGGAT	CTAGGTGAAG	ATCCTTTTTG	ATAATCTCAT	GACCAAAATC	CCTTAACGTG	AGTTTTCGTT
01	CCACTGAGCG	TCAGACCCCG	TAGAAAAGAT	CAAAGGATCT	TCTTGAGATC	CTTTTTTCT	GCGCGTAATC
08	TGCTGCTTGC	AAACAAAAA	ACCACCGCTA	CCAGCGGTGG	TTTGTTTGCC	GGATCAAGAG	CTACCAACTC
15	TTTTCCGAA	GGTAACTGGC	TTCAGCAGAG	CGCAGATACC	AAATACTGTC	CTTCTAGTGT	AGCCGTAGTT
22	AGGCCACCAC	TTCAAGAACT	CIGIAGCACC	GCCTACATAC	CTCGCTCTGC	TAATCCTGTT	ACCAGTGGCT
29	GCTGCCAGTG	GCGATAAGTC	GTGTCTTACC	GGGTTGGACT	CAAGACGATA	GTTACCGGAT	AAGGCGCAGC
36	GGTCGGGCTG	AACGGGGGGT	TCGTGCACAC	AGCCCAGCTT	GGAGCGAACG	ACCTACACCG	AACTGAGATA
43	CCTACAGCGT	GAGCTATGAG	AAAGCGCCAC	GCTTCCCGAA	GGGAGAAAGG	CGGACAGGTA	TCCGGTAAGC
50	GGCAGGGTCG	GAACAGGAGA	GCGCACGAGG	GAGCTTCCAG	GGGGAAACGC	CTGGTATCTT	TATAGTCCTG
57	TCGGGTTTCG	CCACCTCTGA	CTTGAGCGTC	GATTTTTGTG	ATGCTCGTCA	GGGGGGCGGA	GCCTATGGAA
64	AAACGCCAGC	AACGCGGCCT	TTTACGGTT	CCTGGCCTTT	TGCTGGCCTT	TTGCTCACAT	GTTCTTTCCT
3711	GCGTTATCCC	CTGATTCTGT	GGATAACCGT	ATTACCGCCT	TTGAGTGAGC	TGATACCGCT	CGCCGCAGCC
78	GAACGACCGA	GCGCAGCGAG	TCAGTGAGCG	AGGAAGCGGA	AGAGCGCCCA	ATACGCAAAC	CGCCTCTCCC
82	CGCGCGTTGG	CCGATTCATT	AATGCAGCTG	GCACGACAGG	TTTCCCGACT	GGAAAGCGGG	CAGTGAGCGC
3921	AACGCAATTA	ATGTGAGTTA	GCTCACTCAT	TAGGCACCCC	AGGCTTTACA	CTTTATGCTT	CCGGCTCGTA
σ	TGTTGTGG	AATTGTGAGC	GGATAACAAT	TTCACACAGG	AAACAGCTAT	GACCATGATT	ACGCCAAGCG
				KpnI	**	XhoI	
				2 2 2 2 2 2	,	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
4061	CGCAATTAAC	CCTCACTAAA	GGGAACAAAA	GCTGGGTACC	ವವವವವವಾಶ	TCGAGGTCAT	TCATATGCTT
4131	GAGAAGAGAG	TCGGGATAGT	CCAAAATAAA	ACAAAGGTAA	GATTACCTGG	TCAAAAGTGA	AAACATCAGT
4201	TAAAAGGTGG	TATAAGTAAA	ATATCGGTAA	TAAAAGGTGG	CCCAAAGTGA	AATTTACTCT	TTTCTACTAT
4271	TATAAAATT	GAGGATGTTT	TGTCGGTACT	TTGATACGTC	ATTTTTGTAT	GAATTGGTTT	TTAAGTTTAT
4341	TCGCGATTTG	GAAATGCATA	TCTGTATTTG	AGTCGGTTTT	TAAGTTCGTT	GCTTTTGTAA	ATACAGAGGG
4411	ATTTGTATAA	GAAATATCTT	TAAAAAACCC	ATATGCTAAT	TTGACATAAT	TTTTGAGAAA	AATATATT
	ECORI						
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2					
4481	CAGGCGAATT	CCACAATGAA	CAATAATAAG	ATTAAAATAG	೧೯೯೮೦೦೦೦೦	TTGCAGCGAT	GGGTATTTTT

# FIG.\_36D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Sepression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 59 of 154

59 / 154

GTGCAGCCAA	TCGCAGCCAA	GGCCGGAAAA	CCCCATCGCC	CACCTCCTCC	CCCGCCCCTC	GGGTGGGCGA	CGGGCGTGAG			TTTGTGGTAG	CAGCCTCGTG	
ACCCACCCCA	ACCGCACGTC	GGGTCGTGGG	AAGAAACGCC	CCACCACCAC	CGGTAACCAC	TTGGTAGTTT	CTGGCGTCTC			CTTTCTTCTT	GTGACAAATG	
ACCCAACCCA	TGTCCGCACC	AGGTGGGTCC	TCCGCTTCCA	CCTACCACCA	၁၅၁၁၅၁၁၅၁၁	ATCTTTGGCC	GATCTCGCGG	Bglii	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	GATCTTCTTT	TTCATGATTT	
GCCCAACCCA	CACCGTGAGT	GAAAAACAGC	CGGCCCTCCC	TCCCCCCAAC	CCCICCCCT	CTCGGTCTCG	GGAGGGGCGG	Bg		CTCGGATGTA	AGTTTTTCTT	
CACGATCCAT AGCAAGCCCA GCCCAACCCA ACCCAACCCA	GICTCCACCC CCGCCACTAT CACCGTGAGT IGTCCGCACC ACCGCACGTC ICGCAGCCAA	AGAAAGAAAA AAAAGAAAAA GAAAAACAGC AGGTGGGTCC GGGTCGTGGG GGCCGGAAAA	TCGCGAGCAG CGACGAGGCC CGGCCCTCCC TCCGCTTCCA AAGAAACGCC CCCCATCGCC	TACCCCCCC TCTCCTCCCA TCCCCCCAAC CCTACCACCA CCACCACCAC CACCTCCTCC	CCGGACGACG AGCTCCTCCC CCCTCCCCCT CCGCCGCCGC CGGTAACCAC CCCGCCCTC	TTCTCCGTTT TTTTTTCGT CTCGGTCTCG ATCTTTGGCC TTGGTAGTTT GGGTGGGCGA	Greeceaga regereege geaggeege gareregege ergecerere eggeergag			TCCTCGCGGG GAATGGGGCT CTCGGATGTA GATCTTCTTT CTTTCTTCTT TTTGTGGTAG	CCTCAGCATT GTTCATCGGT AGTTTTTCTT TTCATGATTT GTGACAAATG CAGCCTCGTG	
CACGATCCAT	GTCTCCACCC	AGAAAGAAA	TCGCGAGCAG	TACCCCCCC	CCGGACGACG	TTCTCCGTTT	GTCGCCCAGA	Ħ	2 2 2 .	TCCTCGCGGG	CCTCAGCATT	TTGTAGC
4621 AAGTGCTATG	CTGGCAAATA	AAAAAAAAA	GCGAGGAGGA	ACTATATACA	CCCCTCGCTG	TCCTCTTTCT	GAGCGGCTTC	BamHI	1 1 1	TCGGCCCGGA	AATTTGAATC	CGGAGCTTTT
4621	4691	4761	4831	4901	4971	5041	5111			5181	5251	5321

TCTAGTAAAA TAAAAGATAA ACTTAGACTC AAAACATTTA CAAAAACAAC CCCTAAAGTC CTAAAGCCCA

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### FIG.\_36E

60 / 154

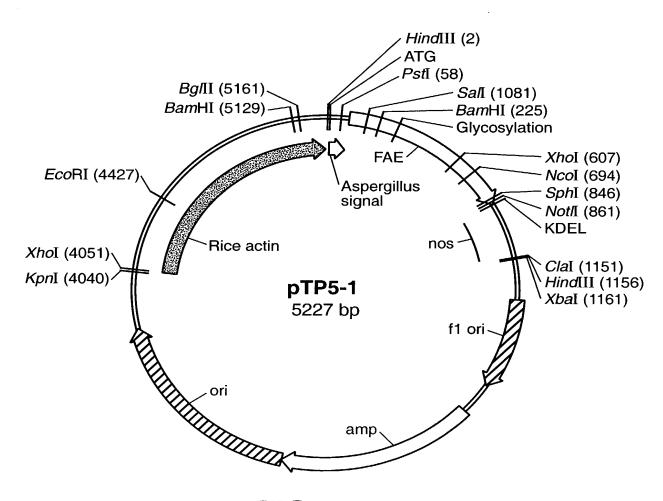


FIG.\_37A

61 / 154

ACCTTCGGCG AACCGCGCAG

CACTCACTGC CGCCCAGCTG TCTGCGACAT ACGACAACAT CCGCCTGTAC

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TTCTCAAACT O ß GACTATTATC AAGGGAGAGA AAATTTACAA GACTGCAGGG ATGGCCACTA Z × н ĸ TCCGAAGACC TCTACAGCCG TTTAGTCGAA CACGICCICG CAGITGIGGI 闰 Ö ĸ Н H ACATTCCGTC ល CTCCGCCAAA щ Ŋ Z AAGCTTAACA TGAAGCAGTT GCAAGGCATC GACCTGTGCA U Н А ď × ď

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CCTCGGCGC TCCCTGGCGG GCTTGTCAA! Ö H Ü GTCCAGGACC AAGTCGAGTC ſщ Ot AGCAGCAAAG AAATAATCAC GGACTACGCG CTGACCGTGA CCGGCCACKC GCCTTTCGAC Н Ö 团 CACGGTGGAT ATTATATTGG ATGGGTCTCC ĸ ល Ø CCGCGACGAC Ö Д ĸ GCCAGTATCC GATGGATCCT Ö BamHI Ö Z H Ö CAGCAGGTTA GACATTAACG *PTGTGAAGTA* GTGATACGAA 闰 Н 211 281 351 421

GACGCAGTAT O GCCCAGATAC Ω щ Ø CAAGCCTCGA Ø 4 Q CGTACATGAA CGATGCCTTC Œ ď А Z Σ × മ GCCTTCGCGT ď Ēų 4 O z Ö 561

GCCCAGGGCG GACAGGGTGT GAATAATGCG CACACGACTT ATTTTGGGAT GACGAGCGGC GCCCATGG( H GCAGGGGTAC Ō O CGACGGCATC CCAAACCTGC Z д G А CTCATGCCAA Z Ö 呂 Н PTCCGGGTCA GTGCTGTGAG ບ æ 631 701 771

# FIG.\_37B

62 / 154

TTTTTATGAT ATGGCAACAA TAATTTCTGT GGATAAATTA AAACCCTGGC GAGGCCCGCA GCGCATTAAG GTTCACGTAG ATTTTGCCGA AAATATTAAC TTCTAAATAC AAAGGAAGAG TACATCGAAC TCGCCGCATA GGCATGACAG TGACAACGAT TGATCGTTGG TCCCGTATCG TCGTTCAAAC CGCTCCTTTC GGGCTCCCTT TAGTGGACTC TGTTTTGCT TGAGCACTTT CCAATTCGCC TTTATAAGGG AAGAAGCAGA GATTATCATA ATGAGATGGG GCGCAAACTA CGTTCTTTAA AATTTTAACA TAATATTGAA GCCTGTAGCA GTGACTGGGA TAATAGCGAA CCCTGTAGCG CCCTAGCGCC TCTAAATCGG TAGGGTGATG TTGTTTTTT TTTCCAATGA AGCAACTCGG TCTTACGGAT TAACTCGCCT CAATTAATAG CGGTGGAGCT TTTGCCTTCC ACGAGTGGGT AACTTACTTC GGTTTATTGC TGGTAAGCCC CCACTGAAGG ATGAGCTGTA GTCTTGCGAT GACGTTATTT GATAGAAAC AAAATATAGC ATTTAACGCG CACTGCGGCC TGGGGCCAGA CTAGAGCGGC CCAGCTGGCG ATGGGACGCG CTTGCCAGCG AAAACTTGAT ATTCTTTGA GAACCCCTAT AATGCTTCAA TTTGCGGCAT AGTTGGGTGC CGAAGAACGT GCCGGGCAAG CAGAAAAGCA GGGGATCATG CCGGCTGGCT TTACAACGTC CCCGTCAAGC TTGGAGTCCA ACACCACGAT TTCCCGGCAA 闰 Ω HindIII TGTAATGCAT CCTGTTGCCG GTTACTAGAT CGATAAGCTT TGAATGGCGA TTTAACAAAA AACCCTGATA GGCCGTCGTT CCCCCTTTCG GACCGCTACA GCCGGCTTTC TCGACCCCAA CCCTTTGACG ATCTCGGTCT AATGTGCGCG TATTCCCTTT GCTGAAGATC CCGTATTGAC TCACCAGTCA TGAGTGATAA GCACAACATG GACGAGCGTG GTTTTCGCCC TTACTCTAGC CTCGGCCCTT ATTGCAGCAC ĸ Н щ TCGCGGTATC TGCAGCACAT TTGCGCAGCC ACTCAACCCT AATGAGCTGA TTTTCGGGGA ATGAGACAAT GTGTCGCCCT GCCATAACCA AAGATTGAAT TGAATTACGT TAAGCATGTA ATAATTAACA TAGAGTCCCG CAATTATACA TTTAATACGC CGCGCTCACT CGCGCAGCGT CGCCACGTTC TTACGGCACC CGGTTTTTCG AGTAAAAGAT ATCCTTGAGA CGGTATTATC GGTTGAGTAC CCGCTTTTT CATACCAAAC GGCGAACTAC CACTTCTGCG GGCCGCGGAA NotI GCATGCACCT GGCCGGTCGC ATTTGGCAAT AAAGTTTCTT CTGGAACAAC TTGGTTAAAA CGCTGGTGAA CAGCGGTAAG TTAATCGCCT TTCCCAACAG GTGGTGGTTA ATTTAGTGCT TAGGTGGCAC GTATCCGCTC TCGTATTACG CTTCCTTTCT CCCTGATAGA CAACATTTCC CTATGTGGCG AGAATGACTT ATGCAGTGCT AAGGAGCTAA TGAATGAAGC ACTATTAACT TGTCATCTAT GTTGCAGGAC AGCGTGGGTC 3 GGAGCCGGTG TAGGGTTCCG TGGGCCATCG **LTTCGGCCTA** CACTATTCTC CGGAGGACCG CGTTGCGCAA CTATAGTGAG GTTACCCAAC CCGATCGCCC CGCGGCGGGT GCTTTCTTCC TTGTTCCAAA GCTTACAATT ATTCAAATAT TATGAGTATT CACCCAGAAA **IGGATCTCAA** PAAGTTCTG **TAAGAGAATT** SAACCGGAGC SGCGGATAAA PCGCGCGCGG H U SphI 981 1191 1261 1331 1401 1471 1541 1611 1681 1751 1821 1891 2171 1961 2031 2101 2241 2311 2381 2451 2521 2591

## FIG.\_37C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Tagetted The Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 63 of 154

63 / 154

0 & 0 0 0 0 0	CTCGCTCTGC TAATCCTGTT CAAGACGATA GTTACCGGAT GGAGCGAACG ACCTACACCG GGGAGAAAGG CGGACAGGTA GGGGAAACGC CTGGTATCTT ATGCTCGTCA GGGGGCGGA TGCTGGCCTT TTGCTCACAT	TIGAGIGAGO IGAIACOGOI AGAGCGCCCA ATACGCAAAC TTTCCCGACT GGAAAGCGGG AGGCTTTACA CTTTATGCTT AAACAGCTAT GACCATGATT Xhoi	GGGCCCCCC TCGAGGTCAT GATTACCTGG TCAAAGTGA CCCAAAGTGA AATTTACTCT ATTTTTGTAT GAATTGGTTT TAAGTTCGTT GCTTTTGTAA TTGACATAAT TTTTGAGAAA	CTTGCCCCCG TTGCAGCGAT CAAAAACAAC CCCTAAAGTC ACCCAACCCA ACCCACCCA TGTCCGCACC ACGCACGTC AGGTGGGTCC GGGTCGTGGG
ACGAAATAGA TCATATATAC ATAATCTCAT CAAAGGATCT CCAGCGGTGG	GCCTACATAC GGGTTGGACT AGCCCAGCTT GCTTCCCGAA GAGCTTCCAG GATTTTTGTG	ALIACCECCI AGGAAGCGGA GCACCACAGG TTCACACAGG	GCTGGGTACC ACAAAGGTAA TAAAAGGTGG TTGATACGTC AGTCGGTTTT	ATTAAAATAG AAAACATTTA GCCCAACCCA CACCGTGAGT GAAAAACAGC
	CTGTAGCACC GTGTCTTACC TCGTGCACAC AAAGCGCCAC GCGCACGAGG CTTGAGCGTC TTTTACGGTT	GCATAACCGI ACAGTGAGCG AATGCAGCTG GCTCACTCAT GGATAACAAT	GGGAACAAAA CCAAAATAAA ATATCGGTAA TGTCGGTACT TCTGTATTTG	CAATAATAAG ACTTAGACTC AGCAAGCCCA CCGGCACTAT
AGTCAGGCAA AACTGTCAGA CTAGGTGAAG TCAGACCCCG AAACAAAAAA	TTCAAGAACT GCGATAAGTC AACGGGGGGT GAGCTATGAG GAACAGGAGA CCACCTCTGA AACGCGGCCT	CIGATICIGI GCGCAGCGAG CCGATTCATT ATGTGAGTTA AATTGTGAGC	CCTCACTAAA TCGGGATAGT TATAAGTAAA GAGGATGTTT GAAATGCATA GAAATATCTT	CCACAATGAA TAAAAGATAA CACGATCCAT GTCTCCACC
CACGACGGGG AAGCATTGGT TTAAAAGGAT CCACTGAGCG TGCTGCTTGC	AGGCCACCAC GCTGCCAGTG GGTCGGGCTG CCTACAGCGT GGCAGGGTCG TCGGGTTTCG AAACGCCAGC	GCGCGTTGCC GAACGACCGA CGCGCGTTGG AACGCAATTA TGTTGTGTGG	CGCAATTAAC GAGAAGAGAG TAAAAGGTGG TATAAAAATT TCGCGATTTG ATTTGTATAA	CAGGCGAATT TCTAGTAAAA AAGTGCTATG CTGGCAAATA
TAGTTATCTA CTCACTGATT CATTTTTAAT AGTTTTCGTT GCGCGTAATC	AGCCGTAGTT ACCAGTGGCT AAGGCGCAGC AACTGAGATA TCCGGTAAGC TATAGTCCTG	GCCGCAGCC CGCCTCCC CAGTGAGCGC CCGGCTCGTA	ACGCCAAGCG TCATATGCTT AAACATCAGT TTTCTACTAT TTAAGTTTAT ATACAGAGGG	AATATATATT GGGTATTTTT CTAAAGCCCA GTGCAGCCAA TCGCAGCCAA
73 80 10 10 10 10	3151 3221 3221 3221 3501 3571	30#1 3711 3781 3921	3991 4061 4131 4201 4341	4411 4481 4551 4621

### FIG.\_37D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted | Fig. 15 | F

64 / 154

CGGCCCTCCC TCCGCTTCCA AAGAACGCC CCACCACCAC CGGTAACCAC TTGGTAGTTT CCTCAGCATT GTTCATCGGT AGTTTTCTT TTCATGATT GTGACAAATG CTGGCGTCTC CTCGGATGTA GATCTTCTTT CTTTCTTCTT CTCGGTCTCG ATCTTTGGCC TCCCCCCAAC CCTACCACCA CCTCCCCT CCGCCGCGC GGAGGGCGG GATCTCGCGG 111111 TCGGCCCGGA TCCTCGCGGG GAATGGGGCT CGACGAGGCC TCTCCTCCCA CCCCTCGCTG CCGGACGACG AGCTCCTCCC TTTTTTCGT TCGGTGCGCG GCGAGGAGGA TCGCGAGCAG GAGCGGCTTC GTCGCCCAGA TACCCCCCC TCCTCTTTCT TTCTCCGTTT CGGAGCTTTT TTGTAGC 222222 BamHI ACTATATACA TTTGTGGTAG AATTTGAATC GGCCGGAAAA CCCCATCGCC CACCTCCTCC CCCGCCCCTC GGGTGGGCGA CGGCGTGAG CAGCCTCGTG 4831 4901 4971 5041 5111 5181 5251

## FIG.\_37E

65 / 154

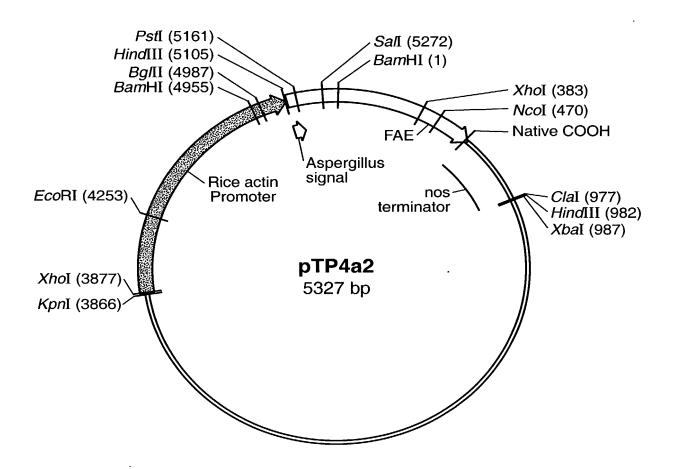


FIG.\_38A

66 / 154

TATTGGATGG GTCTCCGTCC AGGACCAAGT CGAGTCGCTT GTCAAACAGC AGGTTAGCCA GCGCAGCGGC AATCAGGCCT CCACKCCCTC GGCGCCTCCC TGGCGGCACT TTCGACACCC TACCACAATG CAACGGTTGT Q н CAGCTGTCTG CGACATACGA CAACATCCGC CTGTACACCT TCGGCGAACC Ö [±4 GCAAAGAAAT AATCACCGTC GTATCCGGAC TACGCGCTGA CCGTGACCGG CAACTCGATA CTAACTACAC CCTCACGCCT GTGGATATTA А ល Д 141 211 281

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CATGAACGAT GCCTTCCAAG CCTCGAGCCC AGATACGACG CAGTATTTCC Ø ß ď Ø Ŀ ď z Σ TCGCGTCGTA ß 351

AGGGCGGACA GGGTGTGAAT AATGCGCACA CGACTTATTT TGGGATGACG AGCGGAGCCT GTACATGGTG r D GGCATCCCAA ACCTGCCCCC N A H **IGCCAACGAC** Z 421 491 561

TTAACATGTA TTGAATCCTG TTATTTATGA GATGGGTTTT TATGATTAGA GTCCCGCAAT TATACATTTA ATACGCGATA GATGTCCTGG AGAGGGGGCC GCGTAACCA( CATGTAATAA TTTCTTAAGA GGCAATAAAG TTACGTTAAG TCAGCCTCCC CGAGTGTACC AGGAAAGATG TCAAACATTT TTCTGTTGAA AGCAGATCGT ATCATATAAT TGCGATGATT GCTGTAAAGA ATCAGTCATT ATGCATGACG **IGAAGGATGA** 771 631 701

GAAAACAAAA TATAGCGCGC AAACTAGGAT AAATTATCGC GCGCGGTGTC ATCTATGTTA CTAGATCGAT

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FIG.\_38E

.-38B

67 / 154

CTCACTGGCC GCACATCCCC	GCAGCCTGAA	CAGCGTGACC	ACGTTCGCCG	GGCACCTCGA	TTTTCGCCCT	AACCCTATCT	AGCTGATTTA	CGGGGAAATG	GACAATAACC	CGCCCTTATT	AAAGATGCTG	TTGAGAGTTT	ATTATCCCGT	GAGTACTCAC	TAACCATGAG	TTTTTGCAC	CCAAACGACG	AACTACTTAC	TCTGCGCTCG	GGTATCATTG	AGGCAACTAT	GTCAGACCAA	GTGAAGATCC	ACCCCGTAGA	AAAAAAACCA	ACTGGCTTCA	AGAACTCTGT	TAAGTCGTGT	GGGGGTTCGT	TATGAGAAAG	AGGAGAGCGC	CTCTGACTTG	CGGCCTTTTT
ATTACGCGCG TCGCCTTGCA	CAACAGTTGC	TGGTTACGCG	CTTTCTCGCC	AGTGCTTTAC	GATAGACGGT	AACAACACTC	TTAAAAATG	TGGCACTTTT	CCGCTCATGA	ATTTCCGTGT	GGTGAAAGTA	GGTAAGATCC	GTGGCGCGGT	TGACTTGGTT	AGTGCTGCCA	AGCTAACCGC	TGAAGCCATA	TTAACTGGCG	CAGGACCACT	TGGGTCTCGC	ACGGGGAGTC	ATTGGTAACT	AAGGATCTAG	TGAGCGTCAG	GCTTGCAAAC	TCCGAAGGTA	CACCACTTCA	CCAGTGGCGA	GGGCTGAACG	CAGCGTGAGC	GGGTCGGAAC	GTTTCGCCAC	GCCAGCAACG
AGTGAGTCGT CCCAACTTAA	TCGCCCTTCC	GCGGGTGTGG	TCTTCCCTTC	GTTCCGATTT	CCATCGCCCT	TCCAAACTGG	GGCCTATTGG	ACAATTTAGG	AAATATGTAT	AGTATTCAAC	CAGAAACGCT	TCTCAACAGC	GITCIGCIAI	ATTCTCAGAA	AGAATTATGC	GGACCGAAGG	CGGAGCTGAA	GCGCAAACTA	GATAAAGTTG	CCGGTGAGCG	TATCTACACG	CTGATTAAGC	TTTAATTTAA	TICGLICCAC	GTAATCTGCT	CAACTCTTTT	GTAGTTAGGC	GTGGCTGCTG	CGCAGCGGTC	GAGATACCTA	GTAAGCGGCA	GTCCTGTCGG	ATGGAAAAAC
TTCGCCCTAT CCTGGCGTTA	CCCGCACCGA	ATTAAGCGCG	CCTTTCGCTT	TCCCTTTAGG	ACGTAGTGGG	GGACTCTTGT	TGCCGATTTC	ATTAACGCTT	AAATACATTC	GAAGAGTATG	TTTGCTCACC	TCGAACTGGA	CACTTTTAAA	CGCATACACT	TGACAGTAAG	AACGATCGGA	CGTTGGGAAC	CAACAACGTT	GATGGAGGCG	AAATCTGGAG	GTATCGTAGT	AGGTGCCTCA	AAACTTCATT	AACGTGAGTT	TTTTCTGCGC	CAAGAGCTAC	TAGTGTAGCC	CCTGTTACCA	CCGGATAAGG	ACACCGAACT	CAGGTATCCG	TATCTTTATA	GGCGGAGCCT
GGAGCTCCAA CTGGGAAAAC	AGCGAAGAGG	GTAGCGGCGC	AGCGCCCGCT	AATCGGGGGC	GTGATGGTTC	CTTTAATAGT	TAAGGGATTT	TTAACAAAAT	TTATTTTCT	ATTGAAAAAG	CCTTCCTGTT	GTGGGTTACA	CAATGATGAG	ACTCGGTCGC	ACGGATGGCA	TACTTCTGAC	TCGCCTTGAT	GTAGCAATGG	TAATAGACTG	TATTGCTGAT	AAGCCCTCCC	TCGCTGAGAT	GATTGATTTA	AAAATCCCTT	GAGATCCTTT	TTTGCCGGAT	ACTGTCCTTC	CTCTGCTAAT	ACGATAGTTA	CGAACGACCT	GAAAGGCGGA	AAACGCCTGG	TCGTCAGGGG
AGCGGCCGGT AACGTCGTGA	CTGGCGTAAT	GACGCGCCCT	CCAGCGCCCT	TCAAGCTCTA	CTTGATTAGG	AGTCCACGTT	TTTTGATTTA	AACGCGAATT	CCCTATTTGT	CTTCAATAAT	CGGCATTTTG	GGGTGCACGA	GAACGTTTTC	GGCAAGAGCA	AAAGCATCTT	GCGCCCAACT	ATCATGTAAC	CACGATGCCT	CGGCAACAAT	CTGGCTGGTT	GCCAGATGGT	AATAGACAGA	ATATACTTTA	TCTCATGACC	GGATCTTCTT	CGGTGGTTTG	GATACCAAAT	ACATACCTCG	TGGACTCAAG	CAGCTTGGAG	CCCGAAGGGA	TTCCAGGGGG	TTTGTGATGC
AAGCTTCTAG GTCGTTTTAC	CTTTCGCCAG	TGGCGAATGG	GCTACACTTG	GCTTTCCCCG	CCCCAAAAA	TTGACGTTGG	CGGTCTATTC	ACAAAAATTT	TGCGCGGAAC	CTGATAAATG	CCCTTTTTG	AAGATCAGTT	TCGCCCCGAA	ATTGACGCCG	CAGTCACAGA	TGATAACACT	AACATGGGGG	AGCGTGACAC	TCTAGCTTCC	GCCCTTCCGG	CAGCACTGGG	GGATGAACGA	GTTTACTCAT	TTTTTGATAA	AAAGATCAAA	CCGCTACCAG	GCAGAGCGCA	AGCACCGCCT	CTTACCGGGT	GCACACAGCC	CGCCACGCTT	ACGAGGGAGC	AGCGTCGATT
981	Ŋ	σ				47	54		68	75	2	89	96	03	10	17	24	2311	38	45	52	59	99	73	80	87	94	01	08	3151	2	3291	

# FIG.\_38C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Fargetted 1 ...."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No GC648-2

Sheet 68 of 154

68 / 154

AGCAAGCTTA	GCTTTTTTGT	CTCGTGCGGA	CAAATGCAGC	TGATTTGTGA	TTTCTTTTCA	ATCGGTAGTT	5041
AGCATTGTTC HindIII	TGAATCCCTC	CTTCTTTTG TGGTAGAATT	CTTCTTTTG	TTCTTTCTTT	GATGTAGATC	GGGGCTCTCG	4971
199999999		Bglii		9917997971	7149997999	949997979T	4, 0 1
# # # # # # # # # # # # # # # # # # #							
BamHI	Ä						
CCCAGATCGG	GGCTTCGTCG	GGGCGAGAGC	TAGTTTGGGT	TTGGCCTTGG	GTCTCGATCT	TTTCGTCTCG	
CCGTTTTTT	CITICITICI	CCCCTCTCCT	AACCACCCCG	_	CCCCCTCCGC	CCICCCCCI	4761
ACGACGAGCT	TCGCTGCCGG	TCCTCCCCC	CACCACCACC	CCACCACCAC	CCCAACCCTA	CTCCCATCCC	
CCCCCTCTC	TATACATACC	ATCGCCACTA	AACGCCCCCC	CTTCCAAAGA	CCTCCCTCCG	GAGGCCCGGC	
GAGCAGCGAC	GGAGGATCGC	GGAAAAGCGA	CGTGGGGGCC	GGGTCCGGGT	AACAGCAGGT	GAAAAAGAAA	55
AGAAAAAAA	AAAAAAAGAA	AGCCAAAAAA	CACGICICGC	CGCACCACCG	GTGAGTTGTC	CACTATCACC	48
CCACCCCGG	CAAATAGICI	AGCCAACTGG	ACCCCAGTGC	AACCCAACCC	AACCCAACCC	AGCCCAGCCC	41
ATCCATAGCA	GCTATGCACG	AGCCCAAAGT	AAAGTCCTAA	AACAACCCCT	CATTTACAAA	AGACTCAAAA	34
AGATAAACTT	GTAAAATAAA	ATTTTTCTA	AGCGATGGGT	CCCCCGTTGC	AAATAGCTTG	AATAAGATTA	
AATGAACAAT	CGAATTCCAC	TATATTCAGG	GAGAAAATA	CATAATTTTT	GCTAATTTGA	AAACCCATAT	4201
111111111111111111111111111111111111111	ì						
Ecori	-						
TATCTTTAAA	GTATAAGAAA	AGAGGGATTT	TTGTAAATAC	TICGTIGCTI	GGTTTTTAAG	TATTTGAGTC	4131
TGCATATCTG	GATTTGGAAA	GTTTATTCGC	TGGTTTTTAA	TTGTATGAAT	TACGICATIT	GGTACTTTGA	4061
ATGTTTTGTC	AAAATTGAGG	TACTATTATA	TACTCTTTTC	AAGTGAAATT	AGGTGGCCCA	CGGTAATAAA	3991
AGTAAAATAT	AGGTGGTATA	ATCAGTTAAA	AAGTGAAAAC	ACCTGGTCAA	AGGTAAGATT	AATAAAACAA	3921
GATAGTCCAA	AGAGAGTCGG	ATGCTTGAGA	GGTCATTCAT	CCCCCCTCGA	GGTACCGGGC	ACAAAAGCTG	3851
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	;	* * * * * * * * * * * * * * * * * * * *			
		XhoI	Į.	KpnI			
ACTAAAGGGA	ATTAACCCTC	CAAGCGCGCA	ATGATTACGC	AGCTATGACC	CACAGGAAAC	AACAATTTCA	3781
GTGAGCGGAT	GTGTGGAATT	CTCGTATGTT	ATGCTTCCGG	TTTACACTTT	CACCCCAGGC	ACTCATTAGG	3711
GAGTTAGCTC	CAATTAATGT	GAGCGCAACG	AGCGGGCAGT	CCGACTGGAA	GACAGGTTTC	CAGCTGGCAC	3641
TTCATTAATG	CGTTGGCCGA	TCTCCCCGCG	GCAAACCGCC	CGCCCAATAC	AGCGGAAGAG	TGAGCGAGGA	3571
AGCGAGTCAG	GACCGAGCGC	GCAGCCGAAC	ACCGCTCGCC	GTGAGCTGAT	CCGCCTTTGA	AACCGTATTA	3501
TTCTGTGGAT	TATCCCCTGA	TTTCCTGCGT	TCACATGTTC	GGCCTTTTGC	GCCTTTTGCT	ACGGTTCCTG	m

### FIG.\_38D

69 / 154

PstI

GTTCTCCGCC AAACACGTCC TCGCAGTTGT Ø ACATGAAGCA ¥

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Q ß Z ĸ Ö ល Z ບ A D L C GCCGACCTGT B . G W ACGGATG

### 70 / 154

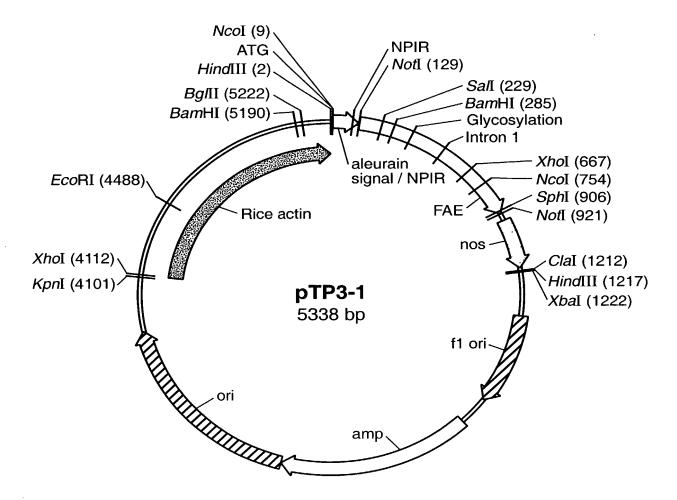


FIG.\_39A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Wallsby Pageted | Fig. 12 | Fig SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 71 of 154

71 / 154

CICCIGGCGC

NPIR

GGCCACGGCC GCCGTCGCC 4 H

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ß TCGCCTCCTC ß 71

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SalI

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D L C N GACCTGTGCA

Ö CCGCGACGAC AGCAGCAAAG ល œ GATGGATCCT 281

351

421 491

561

HindIII

Σ

AAGCTTACCA

 $\leftarrow$ 

П > 跘 4

BamHI

Glycosylation

72 / 154

GCAGGGGTAC GCCCATGGCG GTGTAGAGTA CTGGAGCGTT GATCCTTACA GCGCCCAGAA CACATTTGTC TGCACTGGGG ATGAAGTGCA GTGCTGTGAG CAAGCCTCGA GCCCAGATAC GACGCAGTAT TTCCGGGTCA 闰 ບ œ > ບ Ö **>** NCOL O Ħ 4 А Ü Ö H O CTCATGCCAA CGACGCCATC CCAAACCTGC CCCCGGTGGA 闰 Ŋ Þ Д ρ, GCCTTCGCGT CGTACATGAA CGATGCCTTC Н ď Z Д ល × Ö Д Д Д Z 4 വ 二 ⋈ 631 701 771

XhoI

U 1111 GACGAGCGGC Ø GCCCAGGGCG GACAGGGTGT GAATAATGCG CACACGACTT ATTTTGGGAT Ö Ē Z Z Ö Ü U O

841

Sphi

Not! KDEL

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A A

ATAATTTCTG TTGAATTACG GTTTTTATGA TTAGAGTCCC AGGATAAATT ATCGCGCGCG CATTTGGCAA AAAGAAGCAG ATCGTTCAAA TGATTATCAT CGCGCAAACT TATGAGATGG GGCCGGTCGC GGCCGCGGAA ACCACTGAAG GATGAGCTGT TAAAGTTTCT TAAGATTGAA TCCTGTTGCC GGTCTTGCGA TGACGTTATT CGATAGAAA CAAAATATAG TTAAGCATGT AATAATTAAC ATGTAATGCA GCAATTATAC ATTTAATACG 981 1051 1121

HindIII

ClaI XbaI

CGTTACCCAA TCTAGAGCGG CCGGTGGAGC TCCAATTCGC CCTATAGTGA ACCGATCGCC 9990990909 AGAGGCCCGC GGCGCATTAA AAAACCCTGG CGTGACTGGG GTAATAGCGA GTTGCGCAGC CTGAATGGCG AATGGGACGC GCCCTGTAGC TCCCCCTTTC GCCAGCTGGC TTTACAACGT TGGCCGTCGT TGTTACTAGA TCGATAAGCT TTGCAGCACA GCGCGCTCAC GTGTCATCTA GTCGTATTAC CTTAATCGCC CTTCCCAACA 1191 1261 1331 1401

# FIG.\_39C

73 / 154

NNN 4 5 5 4 5		1 th at at to to		1
CGCTTTCTTC TTAGGGTTCC GTGGGCCATC CTTGTTCCAA ATTTCGGCCT CGCTTACAATA	TCACCCAGAA CTGGATCTCA TTAAAGTTCT ACACTATTCT GTAAGAGAAT	GGGGCGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG	TCATTTTAA GAGTTTTTGGT TGCGCGTAAT GCTACCAACT TACCCAGTGGC	GAACTGAGAT ATATAGTCCT AGCCTATGGA TGTTCTTTCC TCGCCGCAGC CCGCCTCTCC
CGCTT TTAGG GTGGG CTTGT ATTTC CGCTT	TCACC CTGGA TTAAA ACACT	GGAAC ACGTT AGGCG TGGAG GTAGT	TCATT TCATT TGCGC TGCGC TAGCC	GAACT TTATA TGTTC TGTTC TCGCC
CCGCTCCTTT GGGGCTCCCT GGTTCACGTA ATAGTGGACT GATTTTGCCG AAAATATTAA TTTCTAAATA	CTGTTTTTGC TTACATCGAA ATGAGCACTT GTCGCCGCAT	TTGATCGTTG AATGGCAACA GACTGGATGG CTGATAAATC CTCCCGTATC	ATTTAAAACT CCCTTAAAACT CCTTTTTTC CGGATCAAGA CCTTCTAGTG CTAATCCTGT	GACCTACACC GCGGACAGGT CCTGGTATCT AGGGGGGCGG TTTGCTCACA TTTGCTCACA TTTGCTCACA TTTGCTCACA
CCGCC GGGGC GGTTC ATAGT AAAAT TTTCT	CTGTT TTACA ATGAG GTCGC	TTGAT AATGG GACTG CTGAT	ATTTA ATTTA CCCTT CCGAT CCGAT CCTTC	GACCT GACCT CCTGG TTTGC CTGAT AATAC
AGCGC ATCG TTTA TTAAC TTAAC	TAGGG CTCG CTCG	CGCC PATAGC PATTG	AAAAT BAGAT CTTGC CTCG	SAAAG NAACG CCGTC GCCT BTGAG
GCCCTAGCGC CTCTAAATCG TTAGGGTGAT ACGTTCTTTA ATTTATAAGG GAATTTTAACTTTTAACTTTTAACT	TTTTGCCTTC CACGAGTGGG TTTTCCAATG GAGCAACTCGA	GTAACTCGCC TGCCTGTAGC ACAATTAATA TGGTTTATTG ATGGTAAGCC	CTTTAGATOCCE CTTTAGATOC TGACCAAAAT TTCTTGAGAT GTTTGTTTGC CAAATACTGT CCTCGCTCTG	TGGGGGGAAC GGGGGAAACG GGGGGAAACG GATGCTCGTC TTGCTGGCCT TTTGAGTGAG
				TTGT TTGT TTGT TCGT TGGC GGGG
ACTTGCCAGC CCCCGTCAAG AAAAACTTGA GTTGGAGTCC TATTCTTTTG AATTTAACGC GGAACCCCTA	TTTTGGGGGA CAGTTGGGTG CCGAAGAACG CGCCGGGCAA ACAGAAAAGC	GGGGGGTCGT GGGGGGATCGT GGGGGATCGT GTTCCCGGCA TCCGGCTGGC CTGGGGCCAG	CTCATATATA GATAATCTCA TCAAAGGATC ACCAGCGGTG GCGCAGATAC	CAGCCCAGCT CGCTTCCCA GGAGCTTCCA CGATTTTTGT TCCTGGCCTT TATTACCGCC GAGGAAGCGG
TGACCGCTAC CGCCGGCTTT CTCGACCCCA GCCCTTTGAC TATCTCGGTC ATTTAACAAA	TTATTCCCTT TGCTGAAGAT AGTTTTCGCC CCCGTATTGA CTCACCAGTC	TGCACACCAT TGCACGAGCGT CTTACTCTAG GCTCGGCCCT CATTGCAGCA	ACCAAGTTA GATCCTTTTT GTAGAAAAGA AACCACCGCT CTTCAGCAGA TCTGTAGCAC	TTCGTGCACA GAAAGCGCCA AGCGCACGAG ACTTGAGCGT TTTTTACGGT TGGATAACCG GTCAGTGAGC
ACGCGCAGGG TCGCCACGTT TTTACGGCAC ACGGTTTTTC CACTCAACCC AAATGAGCTG	CGTGTCGCCC CGTGTCGCCC AAGTAAAAGA GATCCTTGAG GCGGTATTAT TGGTTGAGTA	ACCCCTTTTT CCATACCAAA TGGCGAACTA CCACTTCTGC CTCGCGGTAT	TAACTGTCAG TAACTGTCAG TCTAGGTGAA GTCAGACCCC CAAACAAAAA AGGTAACTGG	GAACGGGGG GAACGGGGGG GGAACAGGAG GCCACCTCTG CAACGCGGCC CCTGATTCTG AGCGCAGCGA
TGTGGTGGTT CCTTCCTTTC GATTTAGTGC GCCCTGATAG ACTGGAACAA ATTGGTTAAA	TCAACATTTC ACGCTGGTGA ACAGCGGTAA GCTATGTGGC CAGAATGACT	GAAGGAGCTA GAAGGAGCTA AACTATTAAC AGTTGCAGGA GAGCGTGGGT	TAAGCATTGG TAAGCATTGG TTTAAAAGGA TCCACTGGTTG CTGTTTCCGA TAGGCCACCA	CGGTCGGGCT ACCTACAGGG CGGCAGGGTT GTCGGGTTTC AAAACGCCAG TGCGTTATCC CGAACGACCG
				6644466
740 400 400 400 400 400 400 400 400 400	0011286 014486	2 4 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	<b>ひてまよるらこの</b>	855 85 85 85 85

## FIG.\_39D

### 74 / 154

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TCCGGCTCGT TACGCCAAGC	TTCATATGCT	AAAACATCAG TTTTCTACTA	TTTAAGTTTA	AATACAGAGG			TGGGTATTT	CCTAAAGCCC	AGTGCAGCCA	CTCGCAGCCA	GGGCCGGAAA	CCCCCATCGC	CCACCTCCTC	LOCCECCCT	TGGGTGGGCG	CCGGGCGTGA			TTTTGTGGTA	GCAGCCTCGT	
ACTTTATGCT TGACCATGAT XhoI	CTCGAGGTCA	GTCAAAAGTG AAATTTACTC	TGAATTGGTT	TGCTTTTGTA			GTTGCAGCGA	CCCCTAAAGT	AACCCACCC	CACCGCACGT	CGGGTCGTGG	AAAGAAACGC	ACCACCACCA	CCGGTAACCA	CTTGGTAGTT	GCTGGCGTCT			TCTTTCTTCT	TGTGACAAAT	
TTAGGCACCC CAGGCTTTAC TTTCACACAG GAAACAGCTA KpnI		AGATTACCTG GCCCAAAGTG	CATTTTTGTA	TTAAGTTCGT			GCTTGCCCCC	ACAAAAACAA	AACCCAACCC	TTGTCCGCAC	CAGGTGGGTC	CTCCGCTTCC	CCCTACCACC	TCCGCCGCCG	GATCTTTGGC	GGATCTCGCG	Bglii	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AGATCTTCTT	TTTCATGATT	
TTAGGCACCC TTTCACACAG KpnI	AGCTGGGTAC	AACAAAGGTA ATAAAAGGTG	TTTGATACGT	GAGTCGGTTT			GATTAAAATA	CAAAACATTT	AGCCCAACCC	TCACCGTGAG	AGAAAAACAG	CCGGCCCTCC	ATCCCCCCAA	CCCCTCCCCC	TCTCGGTCTC	GGGAGGGCG			TCTCGGATGT	TAGTTTTTCT	
AGCTCACTCA CGGATAACAA	AGGGAACAAA	TCCAAAATAA AATATCGGTA	TTGTCGGTAC	ATCTGTATTT TTAAAAAACC			ACAATAATAA	AACTTAGACT	TAGCAAGCCC	CCCGGCACTA	AAAAAGAAAA	GCGACGAGGC	CTCTCCTCCC	GAGCTCCTCC	TTTTTTCG	ATCGGTGCGC			GGAATGGGGC	TGTTCATCGG	
aatgtgagtt gaattgtgag	CCCTCACTAA	GTCGGGATAG GTATAAGTAA	TGAGGATGTT	GGAAATGCAT AGAAATATCT		2 2 .	TCCACAATGA	ATAAAAGATA	GCACGATCCA	AGTCTCCACC	AAGAAAGAAA	ATCGCGAGCA	ATACCCCCCC	GCCGGACGAC	TITCICCGII	CGTCGCCCAG	HI	*****	ATCCTCGCGG	CCCTCAGCAT	TTTGTAGC
CAACGCAATT ATGTTGTGTG	GCGCAATTAA	TGAGAAGAGA TTAAAAGGTG	TTATAAAAT	TTCGCGATTT G GATTTGTATA A	ECORI	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	TCAGGCGAAT	TTCTAGTAAA	AAAGTGCTAT	ACTGGCAAAT	AAAAAAAAA	AGCGAGGAGG	CACTATATAC	CCCCCTCGCT	CTCCTCTTTC	AGAGCGGCTT	BamH	1	GTCGGCCCGG ATCCTCGCGG	GAATTTGAAT	GCGGAGCTTT TTTGTAGC
3921 3991	4061	4131 4201	4271	4341 4411			4481	4551	4621	4691	4761	4831	4901	4971	5041	5111			5181	5251	5321

### FIG.\_39E

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted The Coll Walls by Targeted The Coll Wall..."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 75 of 154

#### 75 / 154

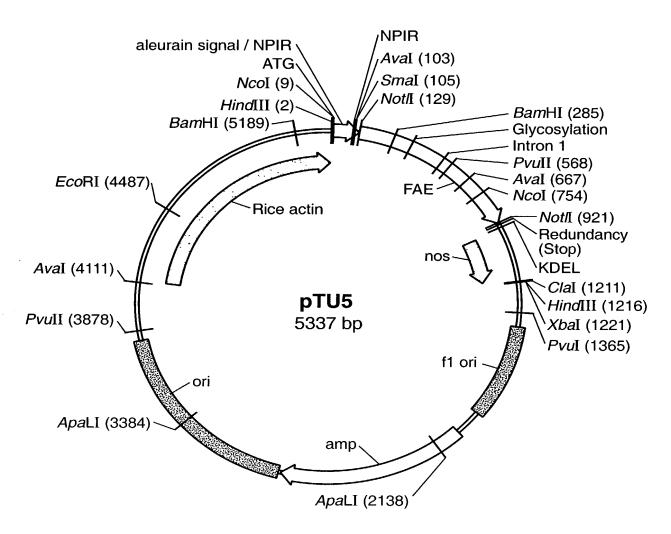


FIG.\_40A

 $\perp$ 

	HindIII No				
1	AAGCTTACCA	TGGCCCACGC	CCGCGTCCTC GGCGCAGGAG		
51			TCGCCTCCTC AGCGGAGGAG		
	SmaI ~~~~~ AvaI		Not	ьт	
	~~~~~		~~~~	~~~~	
101			GACCGCGCGG CTGGCGCGCC		
151			TTTAGTCGAA AAATCAGCTT		
201			ACATTCCGTC TGTAAGGCAG		
				BamHI	
		-		~~~~~	
251			GACATTAACG CTGTAATTGC		
301	AGCAGCAAAG	AAATAATCAC	CGTCTTCCGT	GGCACTGGTA	GTGATACGAA
	TCGTCGTTTC	TTTATTAGTG	GCAGAAGGCA	CCGTGACCAT	CACTATGCTT
351	TCTACAACTC	GATACTAACT	ACACCCTCAC	GCCTTTCGAC	ACCCTACCAC
	AGATGTTGAG	CTATGATTGA	TGTGGGAGTG	CGGAAAGCTG	TGGGATGGTG
401	AATGCAACGG	TTGTGAAGTA	CACGGTGGAT	ATTATATTGG	ATGGGTCTCC
	TTACGTTGCC	AACACTTCAT	GTGCCACCTA	TAATATAACC	TACCCAGAGG
451	GTCCAGGACC	AAGTCGAGTC	GCTTGTCAAA	CAGCAGGTTA	GCCAGTATCC
			CGAACAGTTT		
501			CCGGCCACKC		
	CCTGATGCGC	GACTGGCACT	GGCCGGTGMG	GGAGCCGCGG	AGGGACCGCC
		PvuII			
551	CACTCACTGC	CCCCCACCTC	mcmccca cam	3.CC3.C3.3.C3.M	GGGGGGGGT G
JJ1			AGACGCTGTA		
601	ACCTTCGGCG	AACCGCGCAG	CGGCAATCAG	<b>GCCTTCGCGT</b>	ССТАСАТСАА
<b>-</b>			GCCGTTAGTC		
		AvaI			
		~~~~			
651			GCCCAGATAC CGGGTCTATG		

					•
701			CCAAACCTGC GGTTTGGACG		
	NcoI				•
751			CTGGAGCGTT GACCTCGCAA	<del></del>	
801			ATGAAGTGCA TACTTCACGT		
851			CACACGACTT GTGTGCTGAA		
		~~.	NotI		
901			GGCCGCGGAA CCGGCGCCTT		
951			ATTTGGCAAT TAAACCGTTA		
1001			GATTATCATA CTAATAGTAT		
1051			TGTAATGCAT ACATTACGTA		
1101			CAATTATACA GTTAATATGT		
1151		+ +	GGATAAATTA CCTATTTAAT		
			XbaI		
	-	laI HindIII			
1201			CTAGAGCGGC GATCTCGCCG		
1251	CTATAGTGAG GATATCACTC		CGCGCTCACT GCGCGAGTGA		
1301			GTTACCCAAC CAATGGGTTG		
		PvuII			
1351		CCAGCTGGCG	TAATAGCGAA ATTATCGCTT		
1401			TGAATGGCGA ACTTACCGCT		

1451			GTGGTGGTTA CACCACCAAT		
1501			CGCTCCTTTC GCGAGGAAAG		
1551		GCCGGCTTTC CGGCCGAAAG		TCTAAATCGG AGATTTAGCC	
1601		ATTTAGTGCT TAAATCACGA		TCGACCCCAA AGCTGGGGTT	AAAACTTGAT TTTTGAACTA
1651		GTTCACGTAG CAAGTGCATC	TGGGCCATCG ACCCGGTAGC		CGGTTTTTCG GCCAAAAAGC
1701		TTGGAGTCCA AACCTCAGGT	CGTTCTTTAA GCAAGAAATT		TTGTTCCAAA AACAAGGTTT
1751			ATCTCGGTCT TAGAGCCAGA		TTTATAAGGG AAATATTCCC
1801		TTTCGGCCTA AAAGCCGGAT	TTGGTTAAAA AACCAATTTT	AATGAGCTGA TTACTCGACT	TTTAACAAAA AAATTGTTTT
1851	ATTTAACGCG TAAATTGCGC	AATTTTAACA TTAAAATTGT	AAATATTAAC TTTATAATTG		TAGGTGGCAC ATCCACCGTG
1901	TTTTCGGGGA AAAAGCCCCT	AATGTGCGCG TTACACGCGC	GAACCCCTAT CTTGGGGATA		TTCTAAATAC AAGATTTATG
1951		GTATCCGCTC CATAGGCGAG	ATGAGACAAT TACTCTGTTA	AACCCTGATA TTGGGACTAT	AATGCTTCAA TTACGAAGTT
2001	TAATATTGAA ATTATAACTT	AAAGGAAGAG TTTCCTTCTC	TATGAGTATT ATACTCATAA	CAACATTTCC GTTGTAAAGG	GTGTCGCCCT CACAGCGGGA
2051			TTTGCCTTCC AAACGGAAGG		CACCCAGAAA GTGGGTCTTT
				Apal	LI
2101	CGCTGGTGAA GCGACCACTT		GCTGAAGATC CGACTTCTAG		
2151	TACATCGAAC ATGTAGCTTG		CAGCGGTAAG GTCGCCATTC		
2201			TGAGCACTTT ACTCGTGAAA		
2251			GCCGGGCAAG CGGCCCGTTC		
2301	CACTATTCTC GTGATAAGAG		GGTTGAGTAC CCAACTCATG		

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted From Land Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 79 of 154

### 79 / 154

2351				ATGCAGTGCT TACGTCACGA	
2401		CACTGCGGCC GTGACGCCGG		TGACAACGAT ACTGTTGCTA	
2451				GGGGATCATG CCCCTAGTAC	
2501	TGATCGTTGG ACTAGCAACC	GAACCGGAGC CTTGGCCTCG	TGAATGAAGC ACTTACTTCG		GACGAGCGTG CTGCTCGCAC
2551		GCCTGTAGCA CGGACATCGT	ATGGCAACAA TACCGTTGTT	CGTTGCGCAA GCAACGCGTT	ACTATTAACT TGATAATTGA
2601		TTACTCTAGC AATGAGATCG		CAATTAATAG GTTAATTATC	ACTGGATGGA TGACCTACCT
2651		GTTGCAGGAC CAACGTCCTG		CTCGGCCCTT GAGCCGGGAA	
2701		TGATAAATCT ACTATTTAGA		AGCGTGGGTC TCGCACCCAG	
2751	ATTGCAGCAC TAACGTCGTG			TCCCGTATCG AGGGCATAGC	TAGTTATCTA ATCAATAGAT
2801	CACGACGGGG GTGCTGCCCC		CTATGGATGA GATACCTACT	ACGAAATAGA TGCTTTATCT	CAGATCGCTG GTCTAGCGAC
2851		<del>-</del>		AACTGTCAGA TTGACAGTCT	
2901	TCATATATAC AGTATATATG	TTTAGATTGA AAATCTAACT	TTTAAAACTT AAATTTTGAA	САТТТТТААТ GTAAAAATTA	TTAAAAGGAT AATTTTCCTA
2951	CTAGGTGAAG GATCCACTTC	ATCCTTTTTG TAGGAAAAAC	<del>-</del>	GACCAAAATC CTGGTTTTAG	CCTTAACGTG GGAATTGCAC
3001				TAGAAAAGAT ATCTTTTCTA	
3051	TCTTGAGATC AGAACTCTAG			TGCTGCTTGC ACGACGAACG	
3101	ACCACCGCTA TGGTGGCGAT			GGATCAAGAG CCTAGTTCTC	
3151				CGCAGATACC GCGTCTATGG	
3201	CTTCTAGTGT GAAGATCACA			TTCAAGAACT AAGTTCTTGA	
3251	GCCTACATAC CGGATGTATG			ACCAGTGGCT TGGTCACCGA	

### **FIG.\_40E**

### 80 / 154

		•	,		
3301		GTGTCTTACC CACAGAATGG			
				ApaLI	
3351		GGTCGGGCTG CCAGCCCGAC			
3401		ACCTACACCG TGGATGTGGC			
3451		GCTTCCCGAA CGAAGGGCTT			
3501		GAACAGGAGA CTTGTCCTCT			
3551		TATAGTCCTG ATATCAGGAC			
3601		ATGCTCGTCA TACGAGCAGT			
3651		TTTTACGGTT			
3701		GCGTTATCCC CGCAATAGGG			
3751	TTGAGTGAGC	TGATACCGCT	CGCCGCAGCC	GAACGACCGA	GCGCAGCGAG
2001		ACTATGGCGA AGGAAGCGGA			
3801		TCCTTCGCCT			
			PvuII		
3851		CCGATTCATT GGCTAAGTAA			
3901		CAGTGAGCGC GTCACTCGCG			GCTCACTCAT CGAGTGAGTA
3951		AGGCTTTACA TCCGAAATGT			
4001		GGATAACAAT CCTATTGTTA			
4051	ACGCCAAGCG		CCTCACTAAA	GGGAACAAAA	GCTGGGTACC
	1000011000	AvaI	CONGIGNITI	CCCIIGIIII	COACCOAIGG
4101	 GGGCCCCCCC	~~~~~ TCGAGGTCAT	<b>ጥርል</b> ጥልጥርርጥጥ	GAGAAGAGAG	ጥሮርርርልጥልርጥ
3101		AGCTCCAGTA			

FIG.\_40F

### 81 / 154

4151	+		GATTACCTGG CTAATGGACC		
4201			ATATCGGTAA TATAGCCATT		CCCAAAGTGA GGGTTTCACT
4251			ТАТААААТТ АТАТТТТАА		
4301			GAATTGGTTT CTTAACCAAA		
4351			AGTCGGTTTT TCAGCCAAAA		
4401			GAAATATCTT CTTTATAGAA		
				EcoR	Γ
4451	mm(13 (13 m3 3 m	######################################	AATATATATT	CACCCCAAMM	~~ 
4451			TTATATATAA		
4501	CAATAATAAG	ATTAAAATAG	CTTGCCCCCG	TTGCAGCGAT	GGGTATTTTT
	GTTATTATTC	TAATTTTATC	GAACGGGGGC	AACGTCGCTA	CCCATAAAAA
4551		TAAAAGATAA ATTTTCTATT	ACTTAGACTC		CAAAAACAAC GTTTTTGTTG
	AGAICAIIII	AIIIICIAII	IGAAICIGAG	IIIIGIAAAI	GIIIIIGIIG
4601		•	AAGTGCTATG		
	GGGATTTCAG	GATTTCGGGT	TTCACGATAC	GTGCTAGGTA	TCGTTCGGGT
4651			ACCCACCCCA TGGGTGGGGT		
4701	で中で中ででみででで	СССССАСТАТ	CACCGTGAGT	<b>ጥርጥርርርር አርር</b>	ACCGCACGTC
4/UI			GTGGCACTCA		TGGCGTGCAG
4751			AGAAAGAAAA TCTTTCTTTT		
4801	AGGTGGGTCC	ссстсстссс	GGCCGGAAAA	GCGAGGAGGA	TCGCGAGCAG
			CCGGCCTTTT		
4851			TCCGCTTCCA AGGCGAAGGT		
4901	3 C M 3 M 3 M 3 C 3	ma <i>ccccccc</i>	TCTCCTCCCA	<b>ምሮሮሮሮሮሪ እሮ</b>	<b>でで</b> でみ <i>で</i> でみ <i>で</i> でる
サフリエ			AGAGGAGGGT		
4951	CCACCACCAC	CACCTCCTCC	CCCCTCGCTG	CCGGACGACG	AGCTCCTCCC
			GGGGAGCGAC		
5001			CGGTAACCAC GCCATTGGTG		

### FIG.\_40G

### 82 / 154

TTCTCCGTTT TTTTTTCGT CTCGGTCTCG ATCTTTGGCC TTGGTAGTTT AAGAGGCAAA AAAAAAAGCA GAGCCAGAGC TAGAAACCGG AACCATCAAA  5101 GGGTGGGCGA GAGCGGCTTC GTCGCCCAGA TCGGTGCGCG GGAGGGGCGG CCCACCCGCT CTCGCCGAAG CAGCGGGTCT AGCCACGCGC CCTCCCCGCC  BamHI CCCACCCGC CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG CTAGAGCGCC GACCGCAGAG GCCCCGCACTC AGCCGGCCT AGGAGCGCCC	
GGTGGGCGA GAGCGGCTTC GTCGCCCAGA TCGGTGCGCG GGAGGGGCGG CCCACCCGCT CTCGCCGAAG CAGCGGGTCT AGCCACGCGC CCTCCCCGCC  BamHI  GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG	
CCCACCGCT CTCGCCGAAG CAGCGGGTCT AGCCACGCGC CCTCCCCGCC  BamHI  5151 GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG	
BamHI 5151 GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG	
5151 GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG	
5151 GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG	
CIAGAGEGE GACEGEAGAG GECEGEACIE AGGAGEGEE	
5201 GAATGGGGCT CTCGGATGTA GATCTTCTTT CTTTCTTCTT TTTGTGGTAG	
CTTACCCCGA GAGCCTACAT CTAGAAGAAA GAAAGAAGAA AAACACCATC	
5251 AATTTGAATC CCTCAGCATT GTTCATCGGT AGTTTTTCTT TTCATGATTT	
TTAAACTTAG GGAGTCGTAA CAAGTAGCCA TCAAAAAGAA AAGTACTAAA	
5301 GTGACAAATG CAGCCTCGTG CGGAGCTTTT TTGTAGC	
CACTGTTTAC GTCGGAGCAC GCCTCGAAAA AACATCG	

### FIG.\_40H

#### 83 / 154

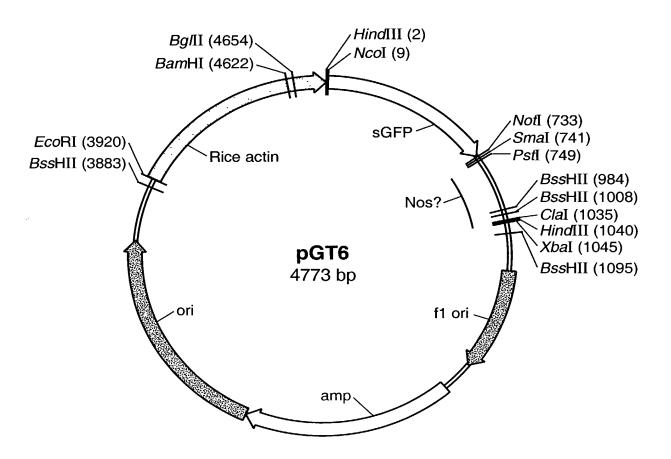


FIG.\_41A

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### 84 / 154

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<b>⊣</b>	TTCGAATGGT	ACCACTCGTT	CCCGCTCCTC	GACAAGTGGC	CCCACCACGG		CTCGACCTGC
71	GCGACGTGAA CGCTGCACTT	CGGCCACAAG GCCGGTGTTC	TTCAGCGTGT AAGTCGCACA	CCGGCGAGGG	CGAGGGCGAT GCTCCCGCTA	GCCACCTACG CGGTGGATGC	GCAAGCTGAC CGTTCGACTG
141	CCTGAAGTTC GGACTTCAAG	ATCTGCACCA TAGACGTGGT	CCGGCAAGCT GGCCGTTCGA	GCCCGTGCCC	TGGCCCACCC	TCGTGACCAC AGCACTGGTG	CTTCACCTAC GAAGTGGATG
211	GGCGTGCAGT	GCTTCAGCCG CGAAGTCGGC	CTACCCCGAC GATGGGGCTG	CACATGAAGC GTGTACTTCG	AGCACGACTT TCGTGCTGAA	CTTCAAGTCC GAAGTTCAGG	GCCATGCCCG CGGTACGGGC
281	AAGGCTACGT TTCCGATGCA	CCAGGAGCGC GGTCCTCGCG	ACCATCTTCT TGGTAGAAGA	TCAAGGACGA AGTTCCTGCT	CGGCAACTAC GCCGTTGATG	AAGACCCGCG TTCTGGGCGC	CCGAGGTGAA GGCTCCACTT
351	GTTCGAGGGC	GACACCCTGG CTGTGGGACC	TGAACCGCAT ACTTGGCGTA	CGAGCTGAAG GCTCGACTTC	GGCATCGACT CCGTAGCTGA	TCAAGGAGGA AGTTCCTCCT	CGGCAACATC GCCGTTGTAG
421	CTGGGGCACA	AGCTGGAGTA TCGACCTCAT	CAACTACAAC GTTGATGTTG	AGCCACAACG TCGGTGTTGC	TCTATATCAT AGATATAGTA	GGCCGACAAG CCGGCTGTTC	Cagaagaacg Gtcttcttgc
491	GCATCAAGGT CGTAGTTCCA	GAACTTCAAG CTTGAAGTTC	ATCCGCCACA TAGGCGGTGT	ACATCGAGGA TGTAGCTCCT	CGGCAGCGTG	CAGCTCGCCG GTCGAGCGGC	ACCACTACCA TGGTGATGGT
561	GCAGAACACC CGTCTTGTGG	CCCATCGGCG	ACGGCCCCGT TGCCGGGGCA	GCTGCTGCCC CGACGACGGG	GACAACCACT CTGTTGGTGA	ACCTGAGCAC TGGACTCGTG	CCAGTCCGCC
631	CTGAGCAAAG	ACCCCAACGA TGGGGTTGCT	GAAGCGCGAT	CACATGGTCC GTGTACCAGG	TGCTGGAGTT ACGACCTCAA	CGTGACCGCC	GCCGGGATCA

HindIII Ncol

### FIG.\_41B

85 / 154

				Not H	PstI		
701	CTCACGGCAT	GGACGAGCTG	TACAAGTAAA	ອອອວອອວວອວ	GGGCTGCAGG	GAAACCACTG	AAGGATGAGC
	GAGTGCCGTA	CCTGCTCGAC	ATGTTCATTT	ວວວອວວອອວອ	CCCGACGTCC	CTTTGGTGAC	TTCCTACTCG
771	TGTAAAGAAG	CAGATCGTTC	AAACATTTGG	CAATAAAGTT	TCTTAAGATT	GAATCCTGTT	GCCGGTCTTG
	ACATTTCTTC	GTCTAGCAAG	TTTGTAAACC	GTTATTTCAA	AGAATTCTAA	CTTAGGACAA	CGGCCAGAAC
841	CGATGATTAT	CATATAATTT	CTGTTGAATT	ACGTTAAGCA	TGTAATAATT	AACATGTAAT	GCATGACGTT
	GCTACTAATA	GTATATTAAA	GACAACTTAA	TGCAATTCGT	ACATTATTAA	TTGTACATTA	CGTACTGCAA
911	ATTTATGAGA	TGGGTTTTTA	TGATTAGAGT	CCCGCAATTA	TACATTTAAT	ACGCGATAGA	AAACAAAATA
	TAAATACTCT	ACCCAAAAAT	ACTAATCTCA	GGGCGTTAAT	ATGTAAATTA	TGCGCTATCT	TTTGTTTTAT
981	BSSHII ~~~~~ TAGCGCGCAA ATCGCGCGTT	ACTAGGATAA TGATCCTATT	BSSHII ~~~~~ ATTATCGCGC TAATAGCGCG C	LI GCGGTGTCAT CGCCACAGTA	CTATGTTACT GATACAATGA	Clai Hindilii ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ	XbaI ~~~~~~ HindIII ~~~~~~~ 'AA GCTTCTAGAG
1051	CGGCCGGTGG	AGCTCCAATT TCGAGGTTAA	CGCCCTATAG GCGGGATATC	TGAGTCGTAT ACTCAGCATA	BSSHII ~~~~~ TACGCGCGCT ATGCGCGCGA	CACTGGCCGT GTGACCGGCA	CGTTTTACAA GCAAAATGTT
1121	CGTCGTGACT GCAGCACTGA	GGGAAAACCC CCCTTTTGGG	TGGCGTTACC	CAACTTAATC GTTGAATTAG	GCCTTGCAGC	ACATCCCCCT TGTAGGGGGA	TTCGCCAGCT AAGCGGTCGA
1191	GGCGTAATAG	CGAAGAGGCC	CGCACCGATC	GCCCTTCCCA	ACAGTTGCGC	AGCCTGAATG	GCGAATGGGA
	CCGCATTATC	GCTTCTCCGG	GCGTGGCTAG	CGGGAAGGGT	TGTCAACGCG	TCGGACTTAC	CGCTTACCCT
1261	CGCGCCCTGT	AGCGGCGCAT TCGCCGCGTA	TAAGCGCGGC	GGGTGTGGTG CCCACACCAC	GTTACGCGCA CAATGCGCGT	GCGTGACCGC	TACACTTGCC ATGTGAACGG

### =1G.\_41C

86 / 154

1331	AGCGCCCTAG TCGCGGGATC	CGCCCGCTCC	TTTCGCTTTC AAAGCGAAAG	TTCCCTTCCT AAGGGAAGGA	TTCTCGCCAC AAGAGCGGTG	GTTCGCCGGC	TTTCCCCGTC AAAGGGGCAG
1401	AAGCTCTAAA	TCGGGGGCTC	CCTTTAGGGT	TCCGATTTAG	TGCTTTACGG	CACCTCGACC	CCAAAAACT
	TTCGAGATTT	AGCCCCCGAG	GGAAATCCCA	AGGCTAAATC	ACGAAATGCC	GTGGAGCTGG	GGTTTTTGA
1471	TGATTAGGGT	GATGGTTCAC	GTAGTGGGCC	ATCGCCCTGA	TAGACGGTTT	TTCGCCCTTT	GACGTTGGAG
	ACTAATCCCA	CTACCAAGTG	CATCACCCGG	TAGCGGGACT	ATCTGCCAAA	AAGCGGGAAA	CTGCAACCTC
1541	TCCACGTTCT	TTAATAGTGG	ACTCTTGTTC	CAAACTGGAA	CAACACTCAA	CCCTATCTCG	GTCTATTCTT
	AGGTGCAAGA	AATTATCACC	TGAGAACAAG	GTTTGACCTT	GTTGTGAGTT	GGGATAGAGC	CAGATAAGAA
1611	TTGATTTATA	AGGGATTTTG	CCGATTTCGG	CCTATTGGTT	<b>AAAAAATGAG</b>	CTGATTTAAC	AAAATTTAA
	AACTAAATAT	TCCCTAAAAC	GGCTAAAGCC	GGATAACCAA	TTTTTTACTC	GACTAAATTG	TTTTTAAATT
1681	CGCGAATTTT GCGCTTAAAA	AACAAAATAT TTGTTTTATA	TAACGCTTAC ATTGCGAATG	AATTTAGGTG TTAAATCCAC	GCACTTTTCG CGTGAAAAGC	GGGAAATGTG CCCTTTACAC	CGCGGAACCC
1751	CTATTTGTTT	ATTTTTCTAA	ATACATTCAA	ATATGTATCC	GCTCATGAGA	CAATAACCCT	GATAAATGCT
	GATAACAAA	TAAAAAGATT	TATGTAAGTT	TATACATAGG	CGAGTACTCT	GTTATTGGGA	CTATTTACGA
1821	TCAATAATAT	TGAAAAAGGA	AGAGTATGAG	TATTCAACAT	TTCCGTGTCG	CCCTTATTCC	CTTTTTGCG
	AGTTATTATA	ACTTTTTCCT	TCTCATACTC	ATAAGTTGTA	AAGGCACAGC	GGGAATAAGG	GAAAAACGC
1891	GCATTTTGCC	TTCCTGTTTT	TGCTCACCCA	GAAACGCTGG	TGAAAGTAAA	AGATGCTGAA	GATCAGTTGG
	CGTAAAACGG	AAGGACAAAA	ACGAGTGGGT	CTTTGCGACC	ACTTTCATTT	TCTACGACTT	CTAGTCAACC
1961	GTGCACGAGT CACGTGCTCA	GGGTTACATC	GAACTGGATC CTTGACCTAG	TCAACAGCGG AGTTGTCGCC	TAAGATCCTT ATTCTAGGAA	GAGAGTTTTC CTCTCAAAAG	GCCCCGAAGA CGGGGCTTCT
2031	ACGTTTTCCA TGCAAAAGGT	ATGATGAGCA TACTACTCGT	CTTTTAAAGT GAAAATTTCA	TCTGCTATGT AGACGATACA	GGCGCGGTAT	TATCCCGTAT ATAGGGCATA	TGACGCCGGG ACTGCGGCCC
2101	CAAGAGCAAC	TCGGTCGCCG	CATACACTAT	TCTCAGAATG	ACTTGGTTGA	GTACTCACCA	GTCACAGAAA
	GTTCTCGTTG	AGCCAGCGGC	GTATGTGATA	AGAGTCTTAC	TGAACCAACT	CATGAGTGGT	CAGTGTCTTT

### FIG.\_41D

87 / 154

2171	AGCATCTTAC TCGTAGAATG	GGATGGCATG	ACAGTAAGAG TGTCATTCTC	AATTATGCAG TTAATACGTC	TGCTGCCATA ACGACGGTAT	ACCATGAGTG TGGTACTCAC	ATAACACTGC TATTGTGACG
2241	GGCCAACTTA	CTTCTGACAA	CGATCGGAGG	ACCGAAGGAG	CTAACCGCTT	TTTTGCACAA	CATGGGGGAT
	CCGGTTGAAT	GAAGACTGTT	GCTAGCCTCC	TGGCTTCCTC	GATTGGCGAA	AAAACGTGTT	GTACCCCCTA
2311	CATGTAACTC	GCCTTGATCG	TTGGGAACCG	GAGCTGAATG	AAGCCATACC	AAACGACGAG	CGTGACACCA
	GTACATTGAG	CGGAACTAGC	AACCCTTGGC	CTCGACTTAC	TTCGGTATGG	TTTGCTGCTC	GCACTGTGGT
2381	CGATGCCTGT	AGCAATGGCA	ACAACGTTGC	GCAAACTATT	AACTGGCGAA	CTACTTACTC	TAGCTTCCCG
	GCTACGGACA	TCGTTACCGT	TGTTGCAACG	CGTTTGATAA	TTGACCGCTT	GATGAATGAG	ATCGAAGGGC
2451	GCAACAATTA	ATAGACTGGA	TGGAGGCGGA	TAAAGTTGCA	GGACCACTTC	TGCGCTCGGC	CCTTCCGGCT
	CGTTGTTAAT	TATCTGACCT	ACCTCCGCCT	ATTTCAACGT	CCTGGTGAAG	ACGCGAGCCG	GGAAGGCCGA
2521	GGCTGGTTTA	TTGCTGATAA	ATCTGGAGCC	GGTGAGCGTG	GGTCTCGCGG	TATCATTGCA	GCACTGGGGC
	CCGACCAAAT	AACGACTATT	TAGACCTCGG	CCACTCGCAC	CCAGAGCGCC	ATAGTAACGT	CGTGACCCCG
2591	CAGATGGTAA	GCCCTCCCGT	ATCGTAGTTA	TCTACACGAC	GGGGAGTCAG	GCAACTATGG	ATGAACGAAA
	GTCTACCATT	CGGGAGGGCA	TAGCATCAAT	AGATGTGCTG	CCCCTCAGTC	CGTTGATACC	TACTTGCTTT
2661	TAGACAGATC	GCTGAGATAG	GTGCCTCACT	GATTAAGCAT	TGGTAACTGT	CAGACCAAGT	TTACTCATAT
	ATCTGTCTAG	CGACTCTATC	CACGGAGTGA	CTAATTCGTA	ACCATTGACA	GTCTGGTTCA	AATGAGTATA
2731	ATACTTTAGA	TTGATTTAAA	ACTTCATTTT	TAATTTAAAA	GGATCTAGGT	GAAGATCCTT	TTTGATAATC
	TATGAAATCT	AACTAAATTT	TGAAGTAAAA	ATTAAATTTT	CCTAGATCCA	CTTCTAGGAA	AAACTATTAG
2801	TCATGACCAA	AATCCCTTAA	CGTGAGTTTT	CGTTCCACTG	AGCGTCAGAC	CCCGTAGAAA	AGATCAAAGG
	AGTACTGGTT	TTAGGGAATT	GCACTCAAAA	GCAAGGTGAC	TCGCAGTCTG	GGGCATCTTT	TCTAGTTTCC
2871	ATCTTCTTGA	GATCCTTTTT	TTCTGCGCGT	AATCTGCTGC	TTGCAAACAA	AAAAACCACC	GCTACCAGCG
	TAGAAGAACT	CTAGGAAAAA	AAGACGCGCA	TTAGACGACG	AACGTTTGTT	TTTTTGGTGG	CGATGGTCGC
2941	GTGGTTTGTT	TGCCGGATCA	AGAGCTACCA	ACTCTTTTTC	CGAAGGTAAC	TGGCTTCAGC	AGAGCGCAGA
	CACCAAACAA	ACGGCCTAGT	TCTCGATGGT	TGAGAAAAG	GCTTCCATTG	ACCGAAGTCG	TCTCGCGTCT

### FIG.\_41E

88 / 154

3011	TACCAAATAC ATGGTTTATG	TGTCCTTCTA ACAGGAAGAT	GTGTAGCCGT	AGTTAGGCCA TCAATCCGGT	CCACTTCAAG GGTGAAGTTC	AACTCTGTAG TTGAGACATC	CACCGCCTAC GTGGCGGATG
3081	ATACCTCGCT TATGGAGCGA	CTGCTAATCC GACGATTAGG	TGTTACCAGT ACAATGGTCA	GGCTGCTGCC	AGTGGCGATA TCACCGCTAT	AGTCGTGTCT TCAGCACAGA	TACCGGGTTG ATGGCCCAAC
3151	GACTCAAGAC	GATAGTTACC	GGATAAGGCG	CAGCGGTCGG	GCTGAACGGG	GGGTTCGTGC	ACACAGCCCA
	CTGAGTTCTG	CTATCAATGG	CCTATTCCGC	GTCGCCAGCC	CGACTTGCCC	CCCAAGCACG	TGTGTCGGGT
3221	GCTTGGAGCG	AACGACCTAC	ACCGAACTGA	GATACCTACA	GCGTGAGCTA	TGAGAAAGCG	CCACGCTTCC
	CGAACCTCGC	TTGCTGGATG	TGGCTTGACT	CTATGGATGT	CGCACTCGAT	ACTCTTTCGC	GGTGCGAAGG
3291	CGAAGGGAGA	AAGGCGGACA	GGTATCCGGT	AAGCGGCAGG	GTCGGAACAG	GAGAGCGCAC	GAGGGAGCTT
	GCTTCCCTCT	TTCCGCCTGT	CCATAGGCCA	TTCGCCGTCC	CAGCCTTGTC	CTCTCGCGTG	CTCCCTCGAA
3361	CCAGGGGGAA	ACGCCTGGTA	TCTTTATAGT	CCTGTCGGGT	TTCGCCACCT	CTGACTTGAG	CGTCGATTTT
	GGTCCCCCTT	TGCGGACCAT	AGAAATATCA	GGACAGCCCA	AAGCGGTGGA	GACTGAACTC	GCAGCTAAAA
3431	TGTGATGCTC ACACTACGAG	GTCAGGGGGG	CGGAGCCTAT GCCTCGGATA	GGAAAAACGC CCTTTTTGCG	CAGCAACGCG GTCGTTGCGC	GCCTTTTTAC CGGAAAAATG	GGTTCCTGGC CCAAGGACCG
3501	CTTTTGCTGG	CCTTTTGCTC	ACATGTTCTT	TCCTGCGTTA	TCCCCTGATT	CTGTGGATAA	CCGTATTACC
	GAAAACGACC	GGAAAACGAG	TGTACAAGAA	AGGACGCAAT	AGGGGACTAA	GACACCTATT	GGCATAATGG
3571	GCCTTTGAGT CGGAAACTCA	GAGCTGATAC CTCGACTATG	CGCTCGCCGC	AGCCGAACGA TCGGCTTGCT	CCGAGCGCAG GGCTCGCGTC	CGAGTCAGTG GCTCAGTCAC	AGCGAGGAAG TCGCTCCTTC
3641	CGGAAGAGCG GCCTTCTCGC	CCCAATACGC GGGTTATGCG	AAACCGCCTC TTTGGCGGAG	TCCCCGCGCG	TTGGCCGATT AACCGGCTAA	CATTAATGCA GTAATTACGT	GCTGGCACGA CGACCGTGCT
3711	CAGGTTTCCC	GACTGGAAAG	CGGGCAGTGA	GCGCAACGCA	ATTAATGTGA	GTTAGCTCAC	TCATTAGGCA
	GTCCAAAGGG	CTGACCTTTC	GCCCGTCACT	CGCGTTGCGT	TAATTACACT	CAATCGAGTG	AGTAATCCGT
3781	CCCCAGGCTT	TACACTTTAT	GCTTCCGGCT	CGTATGTTGT	GTGGAATTGT	GAGCGGATAA	CAATTTCACA
	GGGGTCCGAA	ATGTGAAATA	CGAAGGCCGA	GCATACAACA	CACCTTAACA	CTCGCCTATT	GTTAAAGTGT

### FIG.\_41F

### 89 / 154

				BSSHII			ECORI
3851	CAGGAAACAG GTCCTTTGTC	CTATGACCAT GATACTGGTA	GATTACGCCA CTAATGCGGT	AGCGCGCAAT TCGCGCGTTA	TAACCCTCAC ATTGGGAGTG	TAAAGGGAAC ATTTCCCTTG	AAAAGCTGGA TTTTCGACCT
	ECORI						
3921	ATTCCACAAT TAAGGTGTTA	GAACAATAAT CTTGTTATTA	AAGATTAAAA TTCTAATTTT	TAGCTTGCCC ATCGAACGGG	CCGTTGCAGC	GATGGGTATT CTACCCATAA	TTTTCTAGTA AAAAGATCAT
3991	AAATAAAAGA TTTATTTTCT	TAAACTTAGA ATTTGAATCT	CTCAAAACAT GAGTTTTGTA	TTACAAAAAC AATGTTTTTG	AACCCCTAAA TTGGGGATTT	GTCCTAAAGC CAGGATTTCG	CCAAAGTGCT GGTTTCACGA
4061	ATGCACGATC TACGTGCTAG	CATAGCAAGC GTATCGTTCG	CCAGCCCAAC GGTCGGGTTG	CCAACCCAAC GGTTGGGTTG	CCAACCCACC GGTTGGGTGG	CCAGTGCAGC GGTCACGTCG	CAACTGGCAA GTTGACCGTT
4131	ATAGTCTCCA TATCAGAGGT	CCCCGGCAC	TATCACCGTG ATAGTGGCAC	AGTTGTCCGC TCAACAGGCG	ACCACCGCAC TGGTGGCGTG	GTCTCGCAGC	Caaaaaaaa Gtttttttt
4201	AAAAGAAAGA TTTTCTTTCT	AAAAAAAGAA TTTTTTTCTT	AAAGAAAAAC TTTCTTTTTG	AGCAGGTGGG TCGTCCACCC	TCCGGGTCGT AGGCCCAGCA	GGGGGCCGGA	AAAGCGAGGA TTTCGCTCCT
4271	GGATCGCGAG CCTAGCGCTC	CAGCGACGAG GTCGCTGCTC	GCCCGGCCCT	CCCTCCGCTT	CCAAAGAAAC GGTTTCTTTG	GCCCCCCATC	GCCACTATAT CGGTGATATA
4341	ACATACCCCC TGTATGGGGG	CCCTCTCCTC	CCATCCCCCC	AACCCTACCA TTGGGATGGT	CCACCACCAC	CACCACCTCC GTGGTGGAGG	TCCCCCTCG AGGGGGAGC
4411	CTGCCGGACG GACGGCCTGC	ACGAGCTCCT TGCTCGAGGA	CCCCCTCCC	CCTCCGCCGC	CGCCGGTAAC GCGGCCATTG	CACCCGCCC	CTCTCCTCTT GAGAGGAGAA
4481	TCTTTCTCCG AGAAAGAGGC	TTTTTTTT AAAAAAAAA	CGTCTCGGTC GCAGAGCCAG	TCGATCTTTG AGCTAGAAAC	GCCTTGGTAG CGGAACCATC	TTTGGGTGGG AAACCCACCC	CGAGAGCGGC GCTCTCGCCG
4551	TTCGTCGCCC AAGCAGCGGG	AGATCGGTGC TCTAGCCACG	GCGGGAGGGG	CGGGATCTCG GCCCTAGAGC	CGGCTGGCGT GCCGACCGCA	CTCCGGGCGT	GAGTCGGCCC

# FIG.\_41G

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Tangeted 1 200 17 0 200 Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 90 of 154

90 / 154

GGATCCTCGC GGGGAATGGG GCTCTCGGAT GTAGATCTTC TTTCTTTCTT CTTTTTGTGG TAGAATTTGA CCTAGGAGCG CCCCTTACCC CGAGAGCCTA CATCTAGAAG AAAGAAAGAA GAAAAACACC ATCTTAAACT ATTGTTCATC GGTAGTTTTT CTTTTCATGA TTTGTGACAA ATGCAGCCTC GTGCGGAGCT TAACAAGTAG CCATCAAAAA GAAAAGTACT AAACACTGTT TACGTCGGAG CACGCCTCGA Bglii TTTTTGTAGG TAG ATCCCTCAGC TAGGGAGTCG 22222 4621 4691 4761

BamHI

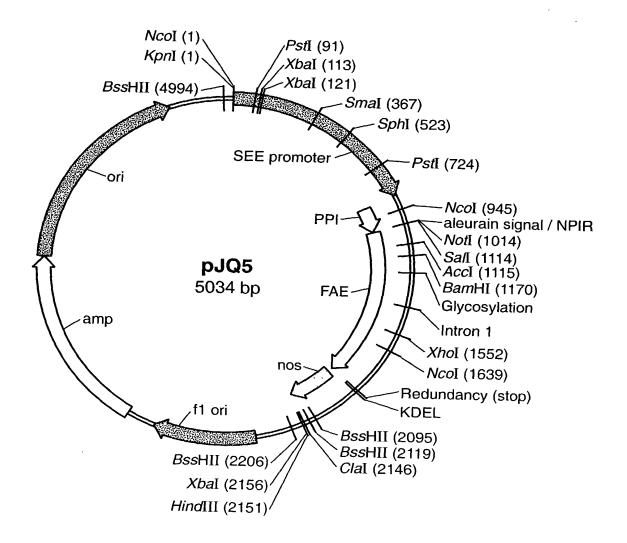


FIG.\_42A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls of Plant Cell Walls of Plant Cell Walls."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 92 of 154

92 / 154

CATGGGCCAG GTATAATTAT (GTACCCGGTC CATATTAATA (			GGGATATCTC CCCTATAGAG	AAGCAAATAA TTCGTTTATT	TCGAAATATC AGCTTTATAG	ACCATTGGCT TGGTAACCGA	ACAATATCTG TGTTATAGAC	,
		FSCL	<b>?</b>		ł	Abal		
71	AGCTCCGAGT TCT TCGAGGCTCA AGA	TCTGACTGCA AGACTGACGT	GTCTGGATGA	CGCGTGTTGT GCGCACAACA	ATCTAGAACT TAGATCTTGA	CTAGATAGCA GATCTATCGT	CAGCCACAGC GTCGGTGTCG	
141	ACCTACAGGA TGGATGTCCT	GTGCGACACT CACGCTGTGA	TGTGGACTGT ACACCTGACA	AGTAGTGTTG TCATCACAAC	GAGACGGAGC	TCTTTCCTAC AGAAAGGATG	CTCCTGACGT GAGGACTGCA	
211	TGCCGCCGTT GTC ACGCCGCCAA CAG	GTCCATTCCA CAGGTAAGGT	ACGGCATCAC TGCCGTAGTG	TCTCAACCAA AGAGTTGGTT	TCACGCGCTC AGTGCGCGAG	CCAACAAAAT GGTTGTTTTA	ATCGTCCCC TAGCAGGGG	
281	ATGTCTTGGC TACAGAACCG	GGAGAGAGAG CCTCTCTCTC	TACATACATG ATGTATGTAC	CTGTCGCGCC	GTTTTTGTCT CAAAAACAGA	GAATCTCGCT CTTAGAGCGA	TCCACTGGCC AGGTGACCGG	
135	なりようむなりません	SmaI	<b>止な</b> の止しをし止しむ	<b>シンン</b> せいせ ない せい	ひしたむしたむしたな	せが正してして	ませいせん みつませい	
1		CGAGGGCCCT	CGAGTGAGTA	AGTTCTAGGG	TAGCAGCAGC	AGTGGGGACC	GCAGTACCCT	
421	TGGAAAAGAA ACCTTTTCTT	CCTCCGTTGC GGAGGCAACG	TCGGATGAGT AGCCTACTCA	CAGCCATATC GTCGGTATAG	CCCGAACAGA GGGCTTGTCT	GTACTGCAAG CATGACGTTC	ATAACCCAAT TATTGGGTTA	
			Sphi	H.				
491	TCAGATTCCC AGTCTAAGGG	CCAATAGAGA GGTTATCTCT	AAGTATAGCA TTCATATCGT	TGCTTTCGGG ACGAAAGCCC	TTTTGTTTGG AAACAAACC	CTTAATTGAC GAATTAACTG	tttattttg aaataaaac	
561	TTGGAGTTGA AACCTCAACT	ATGCTGATTT TACGACTAAA	GTTGTGTAAA CAACACATTT	ATGCCCAACC TACGGGTTGG	ATCTGAATAT TAGACTTATA	CGAGACGGAT GCTCTGCCTA	AATAGGCTGG TTATCCGACC	

Ncoi ~~~~~ Kpni ~

### FIG.\_42B

### 93 / 154

631	CTAATTAATT GATTAATTAA	TATAGCAAGA ATATCGTTCT	TTCTGTAGTG AAGACATCAC	CACATCGCAA GTGTAGCGTT	ATATCTTTCT TATAGAAAGA	GGGCATTACA CCCGTAATGT	GCTGGAGGCT CGACCTCCGA
		Ä	PstI				
701	TCATCAGCCT AGTAGTCGGA	GAAACACTCT CTTTGTGAGA	GCAGAGCCTG CGTCTCGGAC	AAGCAAGTGG TTCGTTCACC	TGAAGCGTGG ACTTCGCACC	CGATGAGATG GCTACTCTAC	GGTATAAAAC CCATATTTTG
771	CCCCGGCACC	GGGACGCGAG	CTCCCGCCTA	CCAGTACCAT GGTCATGGTA	CTCGCCTCGC	TCCCCCTGCC AGGGGGACGG	GGACGACCCA
841	GTAAAATACT CATTTTATGA	GTTGCCCACT	CGCCGGCGAG	ATGGMCGTGC TACCKGCACG	<b>ACAAGGAGGT</b> TGTTCCTCCA	SAACTTCGTS STTGAAGCAS	GCCTACCTCC CGGATGGAGG
911	TGATCGTSCT ACTAGCASGA	CGGCCTCCTC	TTGCTCGTST AACGAGCASA	NGOI CCGCCATGGA GGCGGTACCT	GCACGTGGAC CGTGCACCTG	GCCAAGGCCT CGGTTCCGGA	GCACCCKCGA CGTGGGMGCT
981	GTGCGGCAAC	CTCGGCTTCG GAGCCGAAGC	GCATCTGCCC CGTAGACGGG	Noti GGGGGCGCC CCGCCGCCGG	TCCACGCAGG AGGTGCGTCC	GCATCTCCGA CGTAGAGGCT	AGACCTCTAC TCTGGAGATG
							Sall
1051	AGCCGTTTAG TCGGCAAATC	TCGAAATGGC AGCTTTACCG	CACTATCTCC GTGATAGAGG	CAAGCTGCCT GTTCGACGGA	ACGCCGACCT TGCGGCTGGA	GTGCAACATT CACGTTGTAA	CCGTCGACTA
1121	TTATCAAGGG	AGAGAAAATT TCTCTTTAAA	TACAATTCTC	AAACTGACAT TTTGACTGTA	Ba ~~~ TAACGGATGG	BamHI ~~~~~ G ATCCTCGCG	ACGACAGCAG

## FIG.\_ 42C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 94 of 154

### 94 / 154

1 61 1	GTTTCTTTAT	TAGTGGCAGA	AGGCACCGTG		ACGAAICIAC TGCTTAGATG	AACTCGATAC	TACTACACC	
1261	CTCACGCCTT GAGTGCGGAA	TCGACACCCT AGCTGTGGGA	ACCACAATGC TGGTGTTACG	AACGGTTGTG TTGCCAACAC	AAGTACACGG TTCATGTGCC	TGGATATTAT ACCTATAATA	ATTGGATGGG TAACCTACCC	
1331	TCTCCGTCCA AGAGGCAGGT	GGACCAAGTC CCTGGTTCAG	GAGTCGCTTG CTCAGCGAAC	TCAAACAGCA AGTTTGTCGT	GGTTAGCCAG CCAATCGGTC	TATCCGGACT ATAGGCCTGA	ACGCGCTGAC TGCGCGACTG	
1401	CGTGACCGGC	CACKCCCTCG GTGMGGGAGC	GCGCCTCCCT CGCGGAGGGA	GGCGGCACTC CCGCCGTGAG	ACTGCCGCCC TGACGGCGGG	AGCTGTCTGC TCGACAGACG	GACATACGAC CTGTATGCTG	
1471	AACATCCGCC TTGTAGGCGG	TGTACACCTT ACATGTGGAA	CGGCGAACCG GCCGCTTGGC	CGCAGCGGCA GCGTCGCCGT	ATCAGGCCTT TAGTCCGGAA	CGCGTCGTAC GCGCAGCATG	ATGAACGATG TACTTGCTAC	
1541	CCTTCCAAGC GGAAGGTTCG	XhoI CTCGAGCCCA GAGCTCGGGT	GATACGACGC CTATGCTGCG	AGTATTTCCG TCATAAAGGC	GGTCACTCAT CCAGTGAGTA	GCCAACGACG CGGTTGCTGC	GCATCCCAAA CGTAGGGTTT	
			NCOL	H				
1611	CCTGCCCCCG	GTGGAGCAGG	GGTACGCCCA	CGGTGTA	GAGTACTGGA CTCATGACCT	GCGTTGATCC CGCAACTAGG	TTACAGCGCC AATGTCGCGG	
1681	CAGAACACAT GTCTTGTGTA	TTGTCTGCAC AACAGACGTG	TGGGGATGAA ACCCCTACTT	GTGCAGTGCT CACGTCACGA	GTGAGGCCCA CACTCCGGGT	GGGCGGACAG	GGTGTGAATA CCACACTTAT	
1751	ATGCGCACAC TACGCGTGTG	GACTTATTT CTGAATAAAA	GGGATGACGA CCCTACTGCT	GCGGAGCCTG	TACATGGTGA ATGTACCACT	TCAGTCATTT AGTCAGTAAA	CAGCCTCCCC GTCGGAGGGG	
1821	GAGTGTACCA CTCACATGGT	GGAAAGATGG CCTTTCTACC	ATGTCCTGGA TACAGGACCT	GAGGGGCCG	CGTAACCACT GCATTGGTGA	GAAGGATGAG CTTCCTACTC	CTGTAAAGAA GACATTTCTT	

## FIG.\_42D

95 / 154

GCGATGATTA	TATTTATGAG ATAAATACTC	Bsshii ~~~~~ ATAGCGCGCA TATCGCGCGT	が出立されている。	CGCCGGCCAC	ACGTCGTGAC TGCAGCACTG	TGGCGTAATA ACCGCATTAT	ACGCGCCCTG TGCGCGGGAC	CAGCGCCCTA GTCGCGGGAT	CAAGCTCTAA GTTCGAGATT
TGCCGGTCTT ACGGCCAGAA	TGCATGACGT ACGTACTGCA	ААААСААААТ ТТТТĞТТТТ	Xbal Xbal Hindili	TCGAAGATCT	TCGTTTTACA AGCAAAATGT	TTTCGCCAGC AAAGCGGTCG	GGCGAATGGG CCGCTTACCC	CTACACTTGC GATGTGAACG	CTTTCCCCGT
TGAATCCTGT ACTTAGGACA	TAACATGTAA ATTGTACATT	TACGCGATAG ATGCGCTATC	Clar HindIII	ATCTAGCTAT	TCACTGGCCG	CACATCCCCC GTGTAGGGGG	CAGCCTGAAT GTCGGACTTA	AGCGTGACCG TCGCACTGGC	CGTTCGCCGG
TTCTTAAGAT AAGAATTCTA	ATGTAATAAT TACATTATTA	ATACATTTAA TATGTAAATT		AGATACAATG	BSSHII ~~~~~ TTACGCGCGC AATGCGCGCG	CGCCTTGCAG GCGGAACGTC	AACAGTTGCG TTGTCAACGC	GGTTACGCGC CCAATGCGCG	TTTCTCGCCA AAAGAGCGGT
GCAATAAAGT CGTTATTTCA	TACGTTAAGC ATGCAATTCG	TCCCGCAATT AGGGCGTTAA	**************************************	GCGCCACAGT	GTGAGTCGTA CACTCAGCAT	CCAACTTAAT GGTTGAATTA	CGCCCTTCCC GCGGGAAGGG	CGGGTGTGGT GCCCACACCA	CTTCCCTTCC GAAGGGAAGG
CAAACATTTG GTTTGTAAAC	TCTGTTGAAT AGACAACTTA	ATGATTAGAG TACTAATCTC	BSSHIII	TTAATAGCGC	TCGCCCTATA AGCGGGATAT	CTGGCGTTAC GACCGCAATG	CCGCACCGAT GGCGTGGCTA	TTAAGCGCGG AATTCGCGCC	CTTTCGCTTT GAAAGCGAAA
GCAGATCGTT CGTCTAGCAA	TCATATAATT AGTATATTAA	ATGGGTTTTT TACCCAAAAA	מה מנונו מהי מ	TTGATCCTAT	GAGCTCCAAT CTCGAGGTTA	TGGGAAAACC ACCCTTTTGG	GCGAAGAGGC CGCTTCTCCG	TAGCGGCGCA ATCGCCGCGT	GCGCCCGCTC
1891	1961	2031	1010	1 1 1	2171	2241	2311	2381	2451

## FIG.\_42E

### 96 / 154

											• •
TTGATTAGGG AACTAATCCC	GTCCACGTTC CAGGTGCAAG	TTTGATTTAT AAACTAAATA	ACGCGAATTT TGCGCTTAAA	CCTATTTGTT GGATAAACAA	TTCAATAATA AAGTTATTAT	GGCATTTTGC CCGTAAAACG	GGTGCACGAG CCACGTGCTC	AACGTTTTCC TTGCAAAAGG	GCAAGAGCAA CGTTCTCGTT	AAGCATCTTA TTCGTAGAAT	CGGCCAACTT GCCGGTTGAA
CCCAAAAAC GGGTTTTTTG	TGACGTTGGA	GGTCTATTCT CCAGATAAGA	CAAAAATTTA GTTTTTAAAT	GCGCGGAACC CGCGCCTTGG	TGATAAATGC ACTATTTACG	CCTTTTTTGC GGAAAAAACG	AGATCAGTTG TCTAGTCAAC	CGCCCCGAAG	TTGACGCCGG AACTGCGGCC	AGTCACAGAA TCAGTGTCTT	GATAACACTG CTATTGTGAC
GCACCTCGAC	<b>TTTCGCCCTT</b> AAAGCGGGAA	ACCCTATCTC TGGGATAGAG	GCTGATTTAA CGACTAAATT	GGGGAAATGT CCCCTTTACA	ACAATAACCC TGTTATTGGG	GCCCTTATTC CGGGAATAAG	AAGATGCTGA TTCTACGACT	TGAGAGTTTT ACTCTCAAAA	TTATCCCGTA AATAGGGCAT	AGTACTCACC TCATGAGTGG	AACCATGAGT TTGGTACTCA
GTGCTTTACG CACGAAATGC	ATAGACGGTT TATCTGCCAA	ACAACACTCA TGTTGTGAGT	TAAAAAATGA ATTTTTACT	GGCACTTTTC CCGTGAAAAG	CGCTCATGAG GCGAGTACTC	TTTCCGTGTC AAAGGCACAG	GTGAAAGTAA CACTTTCATT	GTAAGATCCT CATTCTAGGA	TGGCGCGGTA	GACTTGGTTG CTGAACCAAC	GTGCTGCCAT
TTCCGATTTA AAGGCTAAAT	CATCGCCCTG GTAGCGGGAC	CCAAACTGGA GGTTTGACCT	GCCTATTGGT CGGATAACCA	CAATTTAGGT GTTAAATCCA	AATATGTATC TTATACATAG	GTATTCAACA CATAAGTTGT	AGAAACGCTG TCTTTGCGAC	CTCAACAGCG GAGTTGTCGC	TTCTGCTATG AAGACGATAC	TTCTCAGAAT AAGAGTCTTA	GAATTATGCA CTTAATACGT
CCCTTTAGGG GGGAAATCCC	CGTAGTGGGC GCATCACCCG	GACTCTTGTT CTGAGAACAA	GCCGATTTCG CGGCTAAAGC	TTAACGCTTA AATTGCGAAT	AATACATTCA TTATGTAAGT	AAGAGTATGA TTCTCATACT	TTGCTCACCC AACGAGTGGG	CGAACTGGAT GCTTGACCTA	ACTTTTAAAG TGAAAATTTC	GCATACACTA CGTATGTGAT	GACAGTAAGA CTGTCATTCT
ATCGGGGGCT TAGCCCCCGA	TGATGGTTCA ACTACCAAGT	TTTAATAGTG AAATTATCAC	AAGGGATTTT TTCCCTAAAA	TAACAAAATA ATTGTTTTAT	TATTTTCTA ATAAAAAGAT	TTGAAAAAGG AACTTTTTCC	CTTCCTGTTT GAAGGACAAA	TGGGTTACAT ACCCAATGTA	AATGATGAGC TTACTACTCG	CTCGGTCGCC	CGGATGGCAT GCCTACCGTA
2521	2591	2661	2731	2801	2871	2941	3011	3081	3151	3221	3291

### FIG.\_ 42F

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted To the Phenolic Acid Content and Digestibility of Plant Cell Walls."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 97 of 154

97 / 154

3361	ACTTCTGACA TGAAGACTGT	ACGATCGGAG TGCTAGCCTC	GACCGAAGGA CTGGCTTCCT	GCTAACCGCT CGATTGGCGA	TTTTGCACA AAAAACGTGT	ACATGGGGGA	TCATGTAACT AGTACATTGA	
3431	CGCCTTGATC GCGGAACTAG	GTTGGGAACC CAACCCTTGG	GGAGCTGAAT CCTCGACTTA	GAAGCCATAC CTTCGGTATG	CAAACGACGA GTTTGCTGCT	GCGTGACACC	ACGATGCCTG TGCTACGGAC	
3501	TAGCAATGGC ATCGTTACCG	AACAACGTTG TTGTTGCAAC	CGCAAACTAT GCGTTTGATA	TAACTGGCGA ATTGACCGCT	ACTACTTACT TGATGAATGA	CTAGCTTCCC GATCGAAGGG	GGCAACAATT CCGTTGTTAA	
3571	AATAGACTGG TTATCTGACC	ATGGAGGCGG TACCTCCGCC	ATAAAGTTGC TATTTCAACG	AGGACCACTT TCCTGGTGAA	CTGCGCTCGG	CCCTTCCGGC	TGGCTGGTTT ACCGACCAAA	
3641	ATTGCTGATA TAACGACTAT	AATCTGGAGC TTAGACCTCG	CGGTGAGCGT GCCACTCGCA	GGGTCTCGCG CCCAGAGCGC	GTATCATTGC CATAGTAACG	AGCACTGGGG TCGTGACCCC	CCAGATGGTA GGTCTACCAT	
3711	AGCCCTCCCG	TATCGTAGTT ATAGCATCAA	ATCTACACGA TAGATGTGCT	CGGGGAGTCA GCCCCTCAGT	GGCAACTATG CCGTTGATAC	GATGAACGAA CTACTTGCTT	ATAGACAGAT TATCTGTCTA	
3781	CGCTGAGATA GCGACTCTAT	GGTGCCTCAC CCACGGAGTG	TGATTAAGCA ACTAATTCGT	TTGGTAACTG AACCATTGAC	TCAGACCAAG AGTCTGGTTC	TTTACTCATA AAATGAGTAT	TATACTTTAG ATATGAAATC	
3851	ATTGATTTAA TAACTAAATT	AACTTCATTT TTGAAGTAAA	TTAATTTAAA AATTAAATTT	AGGATCTAGG TCCTAGATCC	TGAAGATCCT ACTTCTAGGA	TTTTGATAAT AAAACTATTA	CTCATGACCA GAGTACTGGT	
3921	AAATCCCTTA TTTAGGGAAT	ACGTGAGTTT TGCACTCAAA	TCGTTCCACT AGCAAGGTGA	GAGCGTCAGA CTCGCAGTCT	CCCCGTAGAA GGGGCATCTT	AAGATCAAAG TTCTAGTTTC	GATCTTCTTG CTAGAAGAAC	
3991	AGATCCTTTT TCTAGGAAAA	TTTCTGCGCG AAAGACGCGC	TAATCTGCTG ATTAGACGAC	CTTGCAAACA GAACGTTTGT	AAAAAACCAC TTTTTGGTG	CGCTACCAGC GCGATGGTCG	GGTGGTTTGT CCACCAAACA	
4061	TTGCCGGATC AACGGCCTAG	AAGAGCTACC TTCTCGATGG	AACTCTTTTT TTGAGAAAAA	CCGAAGGTAA GGCTTCCATT	CTGGCTTCAG GACCGAAGTC	CAGAGCGCAG GTCTCGCGTC	ATACCAAATA TATGGTTTAT	
4131	CTGTCCTTCT GACAGGAAGA	AGTGTAGCCG TCACATCGGC	TAGTTAGGCC ATCAATCCGG	ACCACTTCAA TGGTGAAGTT	GAACTCTGTA CTTGAGACAT	GCACCGCCTA	CATACCTCGC GTATGGAGCG	

## FIG.\_ 42G

### 98 / 154

4201	TCTGCTAATC AGACGATTAG	CTGTTACCAG GACAATGGTC	TGGCTGCTGC ACCGACGACG	CAGTGGCGAT GTCACCGCTA	AAGTCGTGTC TTCAGCACAG	TTACCGGGTT AATGGCCCAA	GGACTCAAGA CCTGAGTTCT	
4271	CGATAGTTAC GCTATCAATG	CGGATAAGGC GCCTATTCCG	GCAGCGGTCG CGTCGCCAGC	GGCTGAACGG CCGACTTGCC	GGGGTTCGTG CCCCAAGCAC	CACACAGCCC GTGTGTCGGG	AGCTTGGAGC TCGAACCTCG	
4341	GAACGACCTA CTTGCTGGAT	CACCGAACTG GTGGCTTGAC	AGATACCTAC TCTATGGATG	AGCGTGAGCT TCGCACTCGA	ATGAGAAAGC TACTCTTTCG	GCCACGCTTC	CCGAAGGGAG GGCTTCCCTC	
4411	AAAGGCGGAC TTTCCGCCTG	AGGTATCCGG TCCATAGGCC	TAAGCGGCAG ATTCGCCGTC	GGTCGGAACA CCAGCCTTGT	GGAGAGCGCA CCTCTCGCGT	CGAGGGAGCT GCTCCCTCGA	TCCAGGGGA AGGTCCCCCT	
4481	AACGCCTGGT TTGCGGACCA	ATCTTTATAG TAGAAATATC	TCCTGTCGGG AGGACAGCCC	TTTCGCCACC AAAGCGGTGG	TCTGACTTGA AGACTGAACT	GCGTCGATTT CGCAGCTAAA	TTGTGATGCT AACACTACGA	
4551	CGTCAGGGGG	GCGGAGCCTA CGCCTCGGAT	TGGAAAAACG ACCTTTTTGC	CCAGCAACGC GGTCGTTGCG	GGCCTTTTTA CCGGAAAAT	CGGTTCCTGG GCCAAGGACC	CCTTTTGCTG GGAAACGAC	
4621	GCCTTTTGCT CGGAAAACGA	CACATGTTCT GTGTACAAGA	TTCCTGCGTT AAGGACGCAA	ATCCCCTGAT TAGGGGACTA	TCTGTGGATA AGACACCTAT	ACCGTATTAC TGGCATAATG	CGCCTTTGAG GCGGAAACTC	
4691	TGAGCTGATA ACTCGACTAT	CCGCTCGCCG	CAGCCGAACG GTCGGCTTGC	ACCGAGCGCA TGGCTCGCGT	GCGAGTCAGT CGCTCAGTCA	GAGCGAGGAA CTCGCTCCTT	GCGGAAGAGC CGCCTTCTCG	
4761	GCCCAATACG CGGGTTATGC	CAAACCGCCT GTTTGGCGGA	CTCCCGCGC	GTTGGCCGAT	TCATTAATGC AGTAATTACG	AGCTGGCACG TCGACCGTGC	ACAGGTTTCC TGTCCAAAGG	
4831	CGACTGGAAA GCTGACCTTT	GCGGGCAGTG CGCCCGTCAC	AGCGCAACGC TCGCGTTGCG	AATTAATGTG TTAATTACAC	AGTTAGCTCA TCAATCGAGT	CTCATTAGGC GAGTAATCCG	ACCCCAGGCT TGGGGTCCGA	
4901	TTACACTTTA AATGTGAAAT	TGCTTCCGGC ACGAAGGCCG	TCGTATGTTG AGCATACAAC	TGTGGAATTG ACACCTTAAC	TGAGCGGATA ACTCGCCTAT	ACAATTTCAC TGTTAAAGTG	ACAGGAAACA TGTCCTTTGT	

## FIG.\_42H

Docket No. GC648-2 Sheet 99 of 154

99 / 154

NCOL

KpnI

GCTATGACCA TGATTACGCC AAGCGCGCAA TTAACCCTCA CTAAAGGGAA CAAAAGCTGG GTAC CGATACTGGT ACTAATGCGG TTCGCGCGTT AATTGGGAGT GATTCCCTT GTTTTCGACC CATG

BSSHII

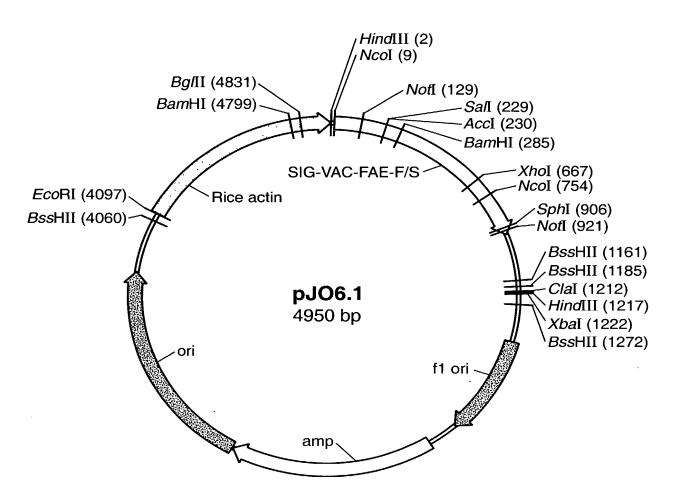


FIG.\_43A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted!"

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 101 of 154

### 101 / 154

ᆏ	AAGCTTACCA TTCGAATGGT	TGGCCCACGC	CCGCGTCCTC	CTCCTGGCGC	TCGCCGTGCT AGCGGCACGA	GGCCACGGCC	GCCGTCGCCG	
						NotI	H 2	
71	TCGCCTCCTC	CTCCTCCTTC	GCCGACTCCA CGGCTGAGGT	ACCCGATCCG TGGGCTAGGC	GCCCGTCACC	GACCGCGCGG	CCGCCTCCAC	
141	GCAGGGCATC CGTCCCGTAG	GCAGGGCATC TCCGAAGACC CGTCCCGTAG AGGCTTCTGG	TCTACAGCCG AGATGTCGGC	TTTAGTCGAA AAATCAGCTT	ATGGCCACTA TACCGGTGAT	TCTCCCAAGC AGAGGGTTCG	TGCCTACGCC ACGGATGCGG	
		Salı	브					
		AccI	* H					
211	GACCTGTGCA CTGGACACGT	ACATTCCGTC TGTAAGGCAG	GTC GACTATTATC CAG CTGATAATAG	AAGGGAGAGA TTCCCTCTCT	AAATTTACAA TTTAAATGTT	TTCTCAAACT AAGAGTTTGA	GACATTAACG CTGTAATTGC	
	BamHI							
281	GATGGATCCT CTACCTAGGA	CCGCGACGACGAC	AGCAGCAAAG TCGTCGTTTC	AAATAATCAC TTTATTAGTG	CGTCTTCCGT GCAGAAGGCA	GGCACTGGTA CCGTGACCAT	GTGATACGAA CACTATGCTT	
351	TCTACAACTC AGATGTTGAG	GATACTAACT CTATGATTGA	ACACCCTCAC TGTGGGAGTG	GCCTTTCGAC	ACCCTACCAC TGGGATGGTG	AATGCAACGG TTACGTTGCC	TTGTGAAGTA AACACTTCAT	
421	CACGGTGGAT GTGCCACCTA	ATTATATTGG TAATATAACC	ATGGGTCTCC TACCCAGAGG	GTCCAGGACC CAGGTCCTGG	AAGTCGAGTC TTCAGCTCAG	GCTTGTCAAA CGAACAGTTT	CAGCAGGTTA GTCGTCCAAT	
491	GCCAGTATCC CGGTCATAGG	GGACTACGCG CCTGATGCGC	CTGACCGTGA GACTGGCACT	CCGGCCACKC	CCTCGGCGCC	TCCCTGGCGG	CACTCACTGC GTGAGTGACG	
561	CGCCCAGCTG	TCTGCGACAT AGACGCTGTA	ACGACAACAT TGCTGTTGTA	CCGCCTGTAC GGCGGACATG	ACCTTCGGCG TGGAAGCCGC	AACCGCGCAG TTGGCGCGTC	CGGCAATCAG GCCGTTAGTC	

HindIII Ncol

### FIG.\_43B

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted" | Digestibility of Plant Cell Walls."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 102 of 154

### 102 / 154

GTCA CAGT	AGTA ICAT	TGAG ACTC	ACCT TGGA	GCAA CGTT	TACG ATGC	TCCC	I I H	0000 0000 0000
TTCCGGGTCA AAGGCCCAGT	GTGTAGAGTA CACATCTCAT	GTGCTGTGAG CACGACACTC	Sphi ccatgcacct cgtacgtgga	CATTTGGCAA GTAAACCGTT	TTGAATTACG AACTTAATGC	TTAGAGTCCC AATCTCAGGG	BSSHII	ATCGCGCGCGCGT TAGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGC
GACGCAGTAT CTGCGTCATA	Ncoi CCCCATGGCG CGGGTACCGC	TGCACTGGGG ATGAAGTGCA ACGTGACCCC TACTTCACGT	GACGAGCGGC CTGCTCGCCG	ATCGTTCAAA TAGCAAGTTT	ATAATTTCTG TATTAAAGAC	GTTTTTATGA CAAAAATACT		AGGATAAATT TCCTATTTAA
GCCCAGATAC CGGGTCTATG	GCAGGGGTAC CGTCCCCATG	-	ATTTTGGGAT TAAAACCCTA	AAAGAAGCAG TTTCTTCGTC	TGATTATCAT ACTAATAGTA	TATGAGATGG ATACTCTACC	BSSHII	CAAAATATAG CGCGCAAACT GTTTTATATC GCGCGTTTGA
CAAGCCTCGA GTTCGGAGCT	CCCCGGTGGA	CACATTTGTC GTGTAAACAG	CACACGACTT GTGTGCTGAA	GATGAGCTGT CTACTCGACA	GGTCTTGCGA CCAGAACGCT	TGACGTTATT ACTGCAATAA	Д₹	
CGATGCCTTC GCTACGGAAG	CCAAACCTGC GGTTTGGACG	GCGCCCAGAA CGCGGGTCTT	GAATAATGCG CTTATTACGC	ACCACTGAAG TGGTGACTTC	TCCTGTTGCC	ATGTAATGCA TACATTACGT		CGATAGAAAA GCTATCTTTT
CGTACATGAA GCATGTACTT	CGACGGCATC GCTGCCGTAG	GATCCTTACA CTAGGAATGT	GACAGGGTGT CTGTCCCACA	NotI GGCCGCGGAA CCGGCGCCTT	TAAGATTGAA ATTCTAACTT	AATAATTAAC TTATTAATTG		ATTTAATACG TAAATTATGC
GCCTTCGCGT CGGAAGCGCA	CTCATGCCAA GAGTACGGTT	CTGGAGCGTT GACCTCGCAA	GCCCAGGGCG	Not GGCCGGTCGC GGC CCGGCCAGCG CCG	TAAAGTTTCT ATTTCAAAGA	TTAAGCATGT AATTCGTACA		GCAATTATAC CGTTAATATG
631	701	771	841	911	981	1051		1121

## FIG.\_43C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targered To The Theorem Superssion of Genes Encoding Cell Wall..."

SN# 09/991,209, Dunn-Coleman et al.

Docket No. GC648-2

Sheet 103 of 154

103 / 154

CCTATAGTGA CACAGTAGAT ACAATGATCT AGCTATTCGA AGATCTCGCC GGCCACCTCG AGGTTAAGCG GGATATCACT CGTTACCCAA GCAATGGGTT TCTCCGGGCG TGGCTAGCGG 9992992929 CCGCGTAATT CGCGCCGCCC acaccaccaa tegegegeege actegegate teaacegee egegatege egegageaa gegaaagaag CCCCGAGGGA AATCCCAAGG GTGGGCCATC CACCCGGTAG CTTGTTCCAA ATTTCGGCCT TAAAGCCGGA CGCTTACAAT ACCGATCGCC CCGCTCCTTT CGCTTTCTTC TTAGGGTTCC GAACAAGGTT AAAATATTAA TCCAATTCGC CGTGACTGGG AAAACCCTGG AGAGGCCCGC GGCGCATTAA GGGCTCCCT GGTTCACGTA CCAAGTGCAT ATAGTGGACT GATTTTGCCG TTTTGGGACC TATCACCTGA CTAAAACGGC CCGGTGGAGC GCACTGACCC CATTATCGCT GCCCTGTAGC CGGGACATCG GCCCTAGCGC TTAGGGTGAT AATCCCACTA ACGTTCTTTA AAATGAGCTG ATTTAACAAA AATTTAACGC GAATTTTAAC CTCTAAATCG GAGATTTAGC TGCAAGAAAT ATTTATAAGG GTGAGTTGGG ATAGAGCCAG ATAAGAAAAC TAAATATTCC GTAATAGCGA TGTTACTAGA TCGATAAGCT TCTAGAGCGG TTACCCTGCG CAACCTCAGG GCGCGCTCAC TGGCCGTCGT TTTACAACGT AAAAACTTGA TTTTTGAACT GTTGGAGTCC CGGTCGACCG AATGGGACGC TGACCGCTAC ACTTGCCAGC CCCCGTCAAG TATTCTTTG CGCGCGAGTG ACCGGCAGCA AAATGTTGCA GGGCAGTTC GCCAGCTGGC AACGTCGTGT AGGGGGAAAG CTGAATGGCG CGCCGGCTTT CTCGACCCCA TCCCCCTTTC GACTTACCGC GCGGCCGAAA GCCCTTTGAC CGGGAAACTG TATCTCGGTC ACGCGCAGCG GGAAGGAAAG AGCGGTGCAA GTTGCGCAGC CAACGCGTCG TTTACGGCAC AAATGCCGTG ACGGTTTTTC TGCCAAAAG TTGCAGCACA TCGCCACGTT CACTCAACCC BSSHII GTGTCATCTA GAATTAGCGG GCCCTGATAG ATTGGTTAAA TGTGGTGGTT CCTTCCTTTC GATTTAGTGC TGACCTTGTT GTCGTATTAC CAGCATAATG CTTCCCAACA GAAGGGTTGT CTAAATCACG CGGGACTATC ACTGGAACAA CTTAATCGCC 1191 1261 1331 1401 1471 1541 1611 1681 1821 1751

XbaI

Clar Hindrin

## FIG.\_43D

TAAATTGTTT TTAAATTGCG CTTAAAATTG

TTTACTCGAC

TAACCAATTT

GCGAATGTTA

TTTATATT

### 104 / 154

											,
CATTCAAATA GTAAGTTTAT	GTATGAGTAT CATACTCATA	TCACCCAGAA AGTGGGTCTT	CTGGATCTCA GACCTAGAGT	TTAAAGTTCT AATTTCAAGA	ACACTATTCT TGTGATAAGA	GTAAGAGAAT CATTCTCTTA	TCGGAGGACC AGCCTCCTGG	GGAACCGGAG CCTTGGCCTC	ACGTTGCGCA TGCAACGCGT	AGGCGGATAA TCCGCCTATT	TGGAGCCGGT ACCTCGGCCA
TTTCTAAATA AAAGATTTAT	AAAAGGAAGA TTTTCCTTCT	CTGTTTTTGC GACAAAAACG	TTACATCGAA AATGTAGCTT	ATGAGCACTT TACTCGTGAA	GTCGCCGCAT CAGCGGCGTA	TGGCATGACA ACCGTACTGT	CTGACAACGA GACTGTTGCT	TTGATCGTTG AACTAGCAAC	AATGGCAACA TTACCGTTGT	GACTGGATGG CTGACCTACC	CTGATAAATC GACTATTTAG
TTTGTTTATT AAACAAATAA	ATAATATTGA TATTATAACT	TTTTGCCTTC AAAACGGAAG	CACGAGTGGG GTGCTCACCC	TTTTCCAATG AAAAGGTTAC	GAGCAACTCG CTCGTTGAGC	ATCTTACGGA TAGAATGCCT	CAACTTACTT GTTGAATGAA	GTAACTCGCC	TGCCTGTAGC	ACAATTAATA TGTTAATTAT	TGGTTTATTG ACCAAATAAC
GGAACCCCTA CCTTGGGGAT	AAATGCTTCA TTTACGAAGT	TTTTGCGGCA AAAACGCCGT	CAGTTGGGTG GTCAACCCAC	CCGAAGAACG GGCTTCTTGC	CGCCGGGCAA	ACAGAAAAGC TGTCTTTTCG	ACACTGCGGC TGTGACGCCG	GGGGGATCAT CCCCCTAGTA	GACACCACGA	CTTCCCGGCA	TCCGGCTGGC
AAATGTGCGC TTTACACGCG	TAACCCTGAT ATTGGGACTA	TTATTCCCTT AATAAGGGAA	TGCTGAAGAT ACGACTTCTA	AGTTTTCGCC TCAAAAGCGG	CCCGTATTGA GGGCATAACT	CTCACCAGTC GAGTGGTCAG	ATGAGTGATA TACTCACTAT	TGCACAACAT ACGTGTTGTA	CGACGAGCGT	CTTACTCTAG GAATGAGATC	GCTCGGCCCT CGAGCCGGGA
CTTTTCGGGG GAAAAGCCCC	CATGAGACAA GTACTCTGTT	CGTGTCGCCC	AAGTAAAAGA TTCATTTTCT	GATCCTTGAG CTAGGAACTC	GCGGTATTAT CGCCATAATA	TGGTTGAGTA ACCAACTCAT	TGCCATAACC ACGGTATTGG	ACCGCTTTTT TGGCGAAAAA	CCATACCAAA GGTATGGTTT	TGGCGAACTA	CCACTTCTGC
TTAGGTGGCA AATCCACCGT	TGTATCCGCT ACATAGGCGA	TCAACATTTC AGTTGTAAAG	ACGCTGGTGA TGCGACCACT	ACAGCGGTAA TGTCGCCATT	GCTATGTGGC CGATACACCG	CAGAATGACT GTCTTACTGA	TATGCAGTGC ATACGTCACG	GAAGGAGCTA CTTCCTCGAT	CTGAATGAAG GACTTACTTC	AACTATTAAC TTGATAATTG	AGTTGCAGGA TCAACGTCCT
1891	1961	2031	2101	2171	2241	2311	2381	2451	2521	2591	2661

### FIG.\_43E

2731	GAGCGTGGGT	CTCGCGGTAT GAGCGCCATA	CATTGCAGCA	CTGGGGCCAG	ATGGTAAGCC TACCATTCGG	CTCCCGTATC GAGGGCATAG	GTAGTTATCT CATCAATAGA
2801	ACACGACGGG TGTGCTGCCC	GAGTCAGGCA CTCAGTCCGT	ACTATGGATG TGATACCTAC	AACGAAATAG TTGCTTTATC	ACAGATCGCT TGTCTAGCGA	GAGATAGGTG CTCTATCCAC	CCTCACTGAT GGAGTGACTA
2871	TAAGCATTGG ATTCGTAACC	TAACTGTCAG ATTGACAGTC	ACCAAGTTTA TGGTTCAAAT	CTCATATATA GAGTATATAT	CTTTAGATTG GAAATCTAAC	ATTTAAAACT TAAATTTTGA	TCATTTTTAA AGTAAAAATT
2941	TTTAAAAGGA AAATTTTCCT	TCTAGGTGAA AGATCCACTT	GATCCTTTTT CTAGGAAAAA	GATAATCTCA CTATTAGAGT	TGACCAAAAT ACTGGTTTTA	CCCTTAACGT GGGAATTGCA	GAGTTTTCGT CTCAAAAGCA
3011	TCCACTGAGC AGGTGACTCG	GTCAGACCCC CAGTCTGGGG	GTAGAAAAGA CATCTTTTCT	TCAAAGGATC AGTTTCCTAG	TTCTTGAGAT AAGAACTCTA	CCTTTTTTC GGAAAAAAAG	TGCGCGTAAT ACGCGCATTA
3081	CTGCTGCTTG	CAAACAAAA GTTTGTTTTT	AACCACCGCT TTGGTGGCGA	ACCAGCGGTG TGGTCGCCAC	GTTTGTTTGC CAAACAAACG	CGGATCAAGA GCCTAGTTCT	GCTACCAACT CGATGGTTGA
3151	CTTTTTCCGA GAAAAAGGCT	AGGTAACTGG TCCATTGACC	CTTCAGCAGA GAAGTCGTCT	GCGCAGATAC CGCGTCTATG	CAAATACTGT GTTTATGACA	CCTTCTAGTG GGAAGATCAC	TAGCCGTAGT ATCGGCATCA
3221	TAGGCCACCA	CTTCAAGAAC GAAGTTCTTG	TCTGTAGCAC AGACATCGTG	CGCCTACATA GCGGATGTAT	CCTCGCTCTG GGAGCGAGAC	CTAATCCTGT GATTAGGACA	TACCAGTGGC ATGGTCACCG
3291	TGCTGCCAGT	GGCGATAAGT CCGCTATTCA	CGTGTCTTAC GCACAGAATG	CGGGTTGGAC GCCCAACCTG	TCAAGACGAT AGTTCTGCTA	AGTTACCGGA TCAATGGCCT	TAAGGCGCAG ATTCCGCGTC
3361	CGGTCGGGCT	GAACGGGGGG	TTCGTGCACA AAGCACGTGT	CAGCCCAGCT	TGGAGCGAAC ACCTCGCTTG	GACCTACACC CTGGATGTGG	GAACTGAGAT CTTGACTCTA
3431	ACCTACAGCG TGGATGTCGC	TGAGCTATGA ACTCGATACT	GAAAGCGCCA CTTTCGCGGT	CGCTTCCCGA	agggagaaag TCCCTCTTTC	GCGGACAGGT CGCCTGTCCA	ATCCGGTAAG TAGGCCATTC
3501	CGGCAGGGTC GCCGTCCCAG	GGAACAGGAG CCTTGTCCTC	AGCGCACGAG TCGCGTGCTC	GGAGCTTCCA	GGGGGAAACG CCCCCTTTGC	CCTGGTATCT GGACCATAGA	TTATAGTCCT AATATCAGGA

#### 106 / 154

3571	GTCGGGTTTC	GCCACCTCTG	ACTTGAGCGT	CGATTTTTGT	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA
	CAGCCCAAAG	CGGTGGAGAC	TGAACTCGCA	GCTAAAAACA	CTACGAGCAG	TCCCCCCGCC	TCGGATACCT
3641	AAAACGCCAG	CAACGCGGCC	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC
	TTTTGCGGTC	GTTGCGCCGG	AAAAATGCCA	AGGACCGGAA	AACGACCGGA	AAACGAGTGT	ACAAGAAAGG
3711	TGCGTTATCC	CCTGATTCTG	TGGATAACCG	TATTACCGCC	TTTGAGTGAG	CTGATACCGC	TCGCCGCAGC
	ACGCAATAGG	GGACTAAGAC	ACCTATTGGC	ATAATGGCGG	AAACTCACTC	GACTATGGCG	AGCGGCGTCG
3781	CGAACGACCG	AGCGCAGCGA TCGCGTCGCT	GTCAGTGAGC CAGTCACTCG	GAGGAAGCGG CTCCTTCGCC	AAGAGCGCCC TTCTCGCGGG	AATACGCAAA TTATGCGTTT	CCGCCTCTCC GGCGGAGAGG
3851	CCGCGCGTTG	GCCGATTCAT CGGCTAAGTA	TAATGCAGCT ATTACGTCGA	GGCACGACAG CCGTGCTGTC	GTTTCCCGAC CAAAGGGCTG	TGGAAAGCGG ACCTTTCGCC	GCAGTGAGCG CGTCACTCGC
3921	CAACGCAATT	AATGTGAGTT	AGCTCACTCA	TTAGGCACCC	CAGGCTTTAC	ACTTTATGCT	TCCGGCTCGT
	GTTGCGTTAA	TTACACTCAA	TCGAGTGAGT	AATCCGTGGG	GTCCGAAATG	TGAAATACGA	AGGCCGAGCA
3991	ATGTTGTGTG TACAACACAC	GAATTGTGAG CTTAACACTC	CGGATAACAA GCCTATTGTT	TTTCACACAG AAAGTGTGTC	GAAACAGCTA CTTTGTCGAT	TGACCATGAT ACTGGTACTA	BSSHII ~~ TACGCCAAGC ATGCGGTTCG
4061	BSSHII ~~~~ GCGCAATTAA CGCGTTAATT	CCCTCACTAA GGGAGTGATT	AGGGAACAAA TCCCTTGTTT	ECORI ~~~~~~ AGCTGGAATT C TCGACCTTAA G	CCACAATGAA GGTGTTACTT	CAATAATAAG GTTATTATTC	ATTAAAATAG TAATTTTATC
4131	CTTGCCCCCG	TTGCAGCGAT AACGTCGCTA	GGGTATTTT CCCATAAAAA	TCTAGTAAAA AGATCATTTT	TAAAAGATAA ATTTTCTATT	ACTTAGACTC TGAATCTGAG	AAAACATTTA TTTTGTAAAT
4201	CAAAAACAAC	CCCTAAAGTC	CTAAAGCCCA	AAGTGCTATG	CACGATCCAT	AGCAAGCCCA	GCCCAACCCA
	GTTTTTGTTG	GGGATTTCAG	GATTTCGGGT	TTCACGATAC	GTGCTAGGTA	TCGTTCGGGT	CGGGTTGGGT

## FIG.\_43G

### 107 / 154

4271	ACCCAACCCA TGGGTTGGGT	ACCCAACCCA ACCCACCCCA TGGGTTGGGT TGGGTGGGGT	GTGCAGCCAA	CTGGCAAATA GACCGTTTAT	GTCTCCACCC	CCGGCACTAT CACCGTGAGT GGCCGTGATA GTGGCACTCA	CACCGTGAGT GTGGCACTCA
4341	TGTCCGCACC	ACCGCACGTC TGGCGTGCAG	TCGCAGCCAA AGCGTCGGTT	AAAAAAAAA TTTTTTTT	AGAAAGAAAA TCTTTCTTTT	AAAAGAAAAA TTTTCTTTTT	GAAAACAGC CTTTTTGTCG
4411	AGGTGGGTCC TCCACCCAGG	AGGTGGGTCC GGGTCGTGGG TCCACCCAGG CCCAGCACCC	GGCCGGAAAA CCGGCCTTTT	GCGAGGAGGA	TCGCGAGCAG AGCGCTCGTC	CGACGAGGCC GCTGCTCCGG	CGGCCCTCCC
4481	TCCGCTTCCA	AAGAAACGCC TTCTTTGCGG	CCCCATCGCC GGGGTAGCGG	ACTATATACA TGATATATGT	TACCCCCCCC	TCTCCTCCCA AGAGGAGGGT	TCCCCCAAC AGGGGGGTTG
4551	CCTACCACCA	CCACCACCAC	CACCTCCTCC GTGGAGGAGG	CCCCTCGCTG	CCGGACGACG GGCCTGCTGC	AGCTCCTCCC TCGAGGAGGG	CCCTCCCCT GGGAGGGGGA
4621	ອວອອວອອວອອ ວອວວອວວອວວ	CCGCCGCCGC CGGTAACCAC GGCGGCGGCG GCCATTGGTG	CCCGCCCCTC	TCCTCTTTCT AGGAGAAAGA	<b>TTCTCCGTTT</b> AAGAGGCAAA	TTTTTTCGT AAAAAAAGCA	CTCGGTCTCG GAGCCAGAGC
4691	ATCTTTGGCC TAGAAACCGG	TTGGTAGTTT AACCATCAAA	GGGTGGGCGA CCCACCGGCT	GAGCGGCTTC CTCGCCGAAG	GTCGCCCAGA	TCGGTGCGCG	GGAGGGGGG
4761	GATCTCGCGG CT	CTGGCGTCTC	CGGGCGTGAG	BamHI     TCGGCCCGGA TCCTCGCGGG		GAATGGGGCT	Bglii ~ CTCGGATGTA
4831	Bglii ~~~~~ GATCTTCTTT	5 5	TTTGTGGTAG	AATTTGAATC	CCTCAGCATT	GTTCATCGGT AGTTTTCTT	AGTITITCTT
4901	CTAGAAGAAA TTCATGATTT AAGTACTAAA	GAAAGAAGAA GTGACAAATG CACTGTTTAC	AAACACCATC CAGCCTCGTG GTCGGAGCAC	TTAAACTTAG CGGAGCTTTT GCCTCGAAAA	GGAGTCGTAA TTGTAGGTAG AACATCCATC	CAAGTAGCCA	TCAAAAGAA

## FIG.\_43H

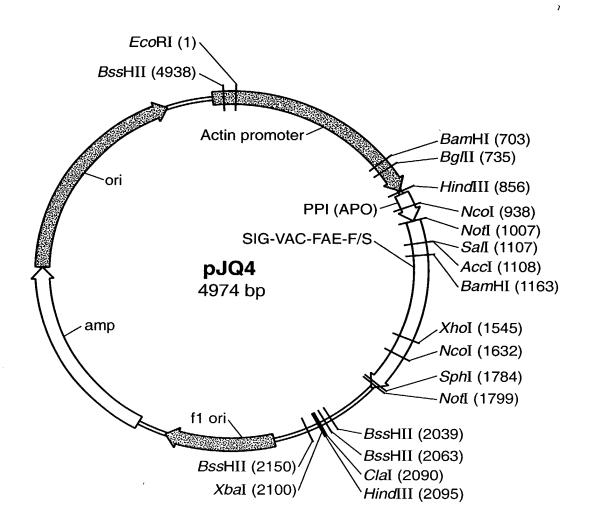


FIG.\_44A

### 109 / 154

	ECORI						
н	AATTCCACAA TTAAGGTGTT	TGAACAATAA ACTTGTTATT	TAAGATTAAA ATTCTAATTT	ATAGCTTGCC TATCGAACGG	CCCGTTGCAG GGGCAACGTC	CGATGGGTAT GCTACCCATA	TTTTTCTAGT AAAAAGATCA
71	AAAATAAAAG TTTTATTTTC	ATAAACTTAG TATTTGAATC	ACTCAAAACA TGAGTTTTGT	TTTACAAAAA AAATGTTTTT	CAACCCCTAA GTTGGGGATT	AGTCCTAAAG TCAGGATTTC	CCCAAAGTGC GGGTTTCACG
141	TATGCACGAT ATACGTGCTA	CCATAGCAAG GGTATCGTTC	CCCAGCCCAA	CCCAACCCAA GGGTTGGGTT	CCCAACCCAC GGGTTGGGTG	CCCAGTGCAG GGGTCACGTC	CCAACTGGCA GGTTGACCGT
211	AATAGTCTCC TTATCAGAGG	ACCCCGGCA	CTATCACCGT GATAGTGGCA	GAGTTGTCCG CTCAACAGGC	CACCACCGCA GTGGTGGCGT	CGTCTCGCAG GCAGAGCGTC	CCAAAAAAA GGTTTTTTT
281	AAAAAGAAAG TTTTTCTTTC	aaaaaaaga tttttttct	AAAAGAAAAA TTTTCTTTTT	CAGCAGGTGG GTCGTCCACC	GTCCGGGTCG	TGGGGGCCGG	AAAAGCGAGG TTTTCGCTCC
351	AGGATCGCGA TCCTAGCGCT	GCAGCGACGA	ອອອນນອອອນນ	TCCCTCCGCT AGGGAGGCGA	TCCAAAGAAA AGGTTTCTTT	CGCCCCCCAT	CGCCACTATA GCGGTGATAT
421	TACATACCCC	CCCCTCTCCT GGGGAGAGGA	CCCATCCCCC	CAACCCTACC GTTGGGATGG	ACCACCACCA TGGTGGTGGT	CCACCACCTC GGTGGTGGAG	CTCCCCCTC
491	GCTGCCGGAC	GACGAGCTCC CTGCTCGAGG	TCCCCCCTCC	CCCTCCGCCG	CCGCCGGTAA GGCGGCCATT	CCACCCGCC	CCTCTCCTCT GGAGGAGA
561	TTCTTTCTCC AAGAAAGAGG	GTTTTTTTT CAAAAAAAA	TCGTCTCGGT AGCAGAGCCA	CTCGATCTTT GAGCTAGAAA	GGCCTTGGTA CCGGAACCAT	GTTTGGGTGG	GCGAGAGCGG CGCTCTCGCC
631	CTTCGTCGCC GAAGCAGCGG	CAGATCGGTG GTCTAGCCAC	CGCGGGAGGG	GCGGGATCTC	GCGGCTGGCG	TCTCCGGGCG	TGAGTCGGCC ACTCAGCCGG
	BamHI			Bglii			
701	CGGATCCTCG	CGGGGAATGG	GGCTCTCGGA	TGTAGATCTT ACATCTAGAA	CTTTCTTTCT GAAAGAAAGA	TCTTTTGTG AGAAAACAC	GTAGAATTTG CATCTTAAAC

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Superssion of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 110 of 154

### 110 / 154

CGTGCGGAGC GCACGCCTCG	TCCTGATCGT AGGACTAGCA	CGAGTGCGGC GCTCACGCCG	TACAGCCGTT ATGTCGGCAA	.~	CAGCAAAGAA GTCGTTTCTT	ACCCTCACGC TGGGAGTGCG	GGGTCTCCGT CCCAGAGGCA
AATGCAGCCT TTACGTCGGA	GTSGCCTACC	CCTGCACCCK	CGAAGACCTC GCTTCTGGAG	Sali Acci Acci ATTCCGTCGA C	GCGACGACAG CGCTGCTGTC	TACTAACTAC ATGATTGATG	TATATTGGAT ATATAACCTA
ATTTGTGACA TAAACACTGT	GGTSAACTTC CCASTTGAAG	GACGCCAAGG CTGCGGTTCC	AGGGCATCTC TCCCGTAGAG	CCTGTGCAAC	BamHI ~~~~~ TGGATCCTCC ACCTAGGAGG	TACAACTCGA ATGTTGAGCT	CGGTGGATAT GCCACCTATA
TCTTTTCATG AGAAAAGTAC	TGCACAAGGA ACGTGTTCCT	GGAGCACGTG CCTCGTGCAC	GCTCCACGC	CCTACGCCGA	CATTAACGGA GTAATTGCCT	GATACGAATC CTATGCTTAG	GTGAAGTACA CACTTCATGT
CGGTAGTTTT GCCATCAAAA	L ACMATGGMCG TGKTACCKGC	NCOI TSTCCGCCAT GG ASAGGCGGTA CC	Noti ccceccecc eeeccecce	TCCCAAGCTG AGGGTTCGAC	CTCAAACTGA GAGTTTGACT	CACTGGTAGT GTGACCATCA	TGCAACGGTT ACGTTGCCAA
CATTGTTCAT GTAACAAGTA	HindIII ~~~~~ GTAGAAGCTT CATCTTCGAA	CTCTTGCTCG	AACCTCGGCT TCGGCATCTG TTGGAGCCGA AGCCGTAGAC	GGCCACTATC CCGGTGATAG	АТТТАСААТТ ТАААТGTTAA	TCTTCCGTGG	CCTACCACAA GGATGGTGTT
AATCCCTCAG TTAGGGAGTC	TTTTTGTAG AAAAACATC	SCTCGGCCTC SGAGCCGGAG	AACCTCGGCT TTGGAGCCGA	TAGTCGAAAT ATCAGCTTTA	GGGAGAGAAA CCCTCTCTTT	ATAATCACCG TATTAGTGGC	CTTTCGACAC
771	841	911	981	1051	1121	1191	1261

### F/G.\_44C

### 111 / 154

1331	CCAGGACCAA GGTCCTGGTT	GTCGAGTCGC CAGCTCAGCG	TTGTCAAACA AACAGTTTGT	GCAGGTTAGC CGTCCAATCG	CAGTATCCGG GTCATAGGCC	ACTACGCGCT TGATGCGCGA	GACCGTGACC CTGGCACTGG
1401	GGCCACKCCC CCGGTGMGGG	TCGGCGCCTC	CCTGGCGGCA	CTCACTGCCG	CCCAGCTGTC GGGTCGACAG	TGCGACATAC ACGCTGTATG	GACAACATCC CTGTTGTAGG
1471	GCCTGTACAC CGGACATGTG	CTTCGGCGAA GAAGCCGCTT	CCGCGCAGCG	GCAATCAGGC CGTTAGTCCG	CTTCGCGTCG	TACATGAACG ATGTACTTGC	ATGCCTTCCA TACGGAAGGT
1541	XhoI ~~~~~ AGCCTCGAGC TCGGAGCTCG	CCAGATACGA GGTCTATGCT	CGCAGTATTT GCGTCATAAA	CCGGGTCACT GGCCCAGTGA	CATGCCAACG GTACGGTTGC	ACGGCATCCC TGCCGTAGGG	AAACCTGCCC TTTGGACGGG
1611	CCGGTGGAGC GGCCACCTCG	AGGGGTACGC TCCCCATGCG	Ncol CCATGGCGGT GGTACCGCCA	GTAGAGTACT CATCTCATGA	GGAGCGTTGA CCTCGCAACT	TCCTTACAGC AGGAATGTCG	GCCCAGAACA CGGGTCTTGT
1681	CATTTGTCTG GTAAACAGAC	CACTGGGGAT GTGACCCCTA	GAAGTGCAGT CTTCACGTCA	GCTGTGAGGC	CCAGGGCGGA	CAGGGTGTGA GTCCCACACT	ATAATGCGCA TATTACGCGT
			18. 	Sphi	Noti	H *	
1751	CACGACTTAT GTGCTGAATA	TTTGGGATGA AAACCCTACT	CGAGCGGCGC	ATGCACCTGG TACGTGGACC	CCGGTCGCGG	CCGCGGAAAC GGCGCCTTTG	CACTGAAGGA GTGACTTCCT
1821	TGAGCTGTAA ACTCGACATT	AGAAGCAGAT TCTTCGTCTA	CGTTCAAACA GCAAGTTTGT	TTTGGCAATA AAACCGTTAT	AAGTTTCTTA TTCAAAGAAT	AGATTGAATC TCTAACTTAG	CTGTTGCCGG GACAACGGCC
1891	TCTTGCGATG AGAACGCTAC	ATTATCATAT TAATAGTATA	aatttctgtt Ttaaagacaa	GAATTACGTT CTTAATGCAA	AAGCATGTAA TTCGTACATT	TAATTAACAT ATTAATTGTA	GTAATGCATG CATTACGTAC
1961	ACGTTATTTA TGCAATAAAT	TGAGATGGGT ACTCTACCCA	TTTTATGATT AAAATACTAA	AGAGTCCCGC TCTCAGGGCG	AATTATACAT TTAATATGTA	TTAATACGCG AATTATGCGC	ATAGAAAACA TATCTTTTGT

# FIG.\_44D

112 / 154

<b>≀</b> ⊢	ប្រ		E d	ប្រ	<b>4</b> : F⊢	ប្រ	ប្រា	<b>4</b>	H 4º	Æ Fi	at Fu
~~ Hindiii	TAAGCTT( ATTCGAA		CGTT	TTCG( AAGC(	GCGA	raca( ATGT(	rttc( AAAG(	CCAA	BACG'	STCT.	AAAA ITTT
	GATAAGCTTC CTATTCGAAG		GCCGTCGTTT CGGCAGCAAA	CCCCTTTCGC	GAATGGCGAA CTTACCGCTT	ACCGCTACAC TGGCGATGTG	CCGGCTTTCC	CGACCCCAAA GCTGGGGTTT	CCTTTGACGT GGAAACTGCA	TCTCGGTCTA AGAGCCAGAT	TTAACAAAAA AATTGTTTTT
ClaI	2										
	TTACTAGATC		GCGCTCACTG	GCAGCACATC	TGCGCAGCCT ACGCGTCGGA	GCGCAGCGTG	GCCACGTTCG	TACGGCACCT ATGCCGTGGA	GGTTTTTCGC CCAAAAAGCG	CTCAACCCTA GAGTTGGGAT	ATGAGCTGAT TACTCGACTA
	TTAC	Bsshii		GCAC	TGCG	9 ၁၅ ၁၅ ၁၅ ၁၅	GCC2 CGG3	TACG	GGT	CTCZ	ATG
	TATG ATAC	BS	CGTATTACGC	CCTT	CAGT	TTAC	TCTC	GCTT	AGAC	AACA TTGT	AAAA TTTT
	GTCATCTATG CAGTAGATAC		TATT	TAATCGCCTT ATTAGCGGAA	TCCCAACAGT AGGGTTGTCA	TGGTGGTTAC ACCACCAATG	TTCCTTTCTC AAGGAAAGAG	<b>TTTAGTGCTT</b> <b>AAATCACGAA</b>	CCTGATAGAC GGACTATCTG	TGGAACAACA ACCTTGTTGT	TGGTTAAAAA ACCAATTTTT
				_				_			
Ħ	,,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		TGAG	CAAC	စ္ပစ္ပစ္သ	GGGT	TTCC	TCCG	ATCG	CAAA	CCTA
BSSHII	CGCGCGCGGT		TATAGTGAGT ATATCACTCA	TTACCCAACT AATGGGTTGA	CGATCGCCCT GCTAGCGGGA	GCGCCGGGTG	CTTTCTTCCC GAAAGAAGGG	AGGGTTCCGA TCCCAAGGCT	GGGCCATCGC CCCGGTAGCG	TGTTCCAAAC ACAAGGTTTG	<b>TTCGGCCTAT</b> AAGCCGGATA
			-	-							
	GATAAATTAT CTATTTAATA		CAATTCGCCC GTTAAGCGGG	AACCCTGGCG TTGGGACCGC	AGGCCCGCAC TCCGGGCGTG	CGCATTAAGC GCGTAATTCG	GCTCCTTTCG CGAGGAAAGC	GGCTCCCTTT CCGAGGGAAA	TTCACGTAGT AAGTGCATCA	AGTGGACTCT TCACCTGAGA	ttttgccgat Aaaacggcta
				-							-
	ACTAG		GCTC	GGAA	GAAG	16CGG	၁၁၁၅	2225	ATG	TAAT	GGGA
ы	~~~ CGCAAACTAG GCGTTTGATC		GGTGGAGCTC CCACCTCGAG	TGACTGGGAA ACTGACCCTT	AATAGCGAAG TTATCGCTTC	CCTGTAGCGG GGACATCGCC	CCTAGCGCCC GGATCGCGGG	CTAAATCGGG GATTTAGCCC	AGGGTGATGG TCCCACTACC	GTTCTTTAAT CAAGAAATTA	ttataaggga Aatattccct
BSSHII	ł				_						
Ä	~~~ AAATATAGCG TTTATATCGC		TAGAGCGGCC ATCTCGCCGG	TACAACGTCG ATGTTGCAGC	rggc Accg	TGGGACGCGC ACCCTGCGCG	TTGCCAGCGC AACGGTCGCG	CAAG	rtga: aactz	rggagtccac acctcaggtg	rttg aaact
	~~~ AAATATAGCG TTTATATCGC	XbaI	TAGAGCGGCC	TACAACGTCG ATGTTGCAGC	CAGCTGGCGT GTCGACCGCA	TGGGACGCGC	TTGCCAGCGC	CCGTCAAGCT GGCAGTTCGA	AAACTTGATT TTTGAACTAA	TGGAGTCCAC ACCTCAGGTG	TTCTTTTGAT AAGAAAACTA
	2031		2101	2171	2241	2311	2381	2451	2521	2591	2661
	7		7	7	7	7	0	Ŋ	Ø	Ø	Ñ

# FIG.\_44E

### 113 / 154

2731	TTTAACGCGA	ATTTTAACAA	AATATTAACG	CTTACAATTT	AGGTGGCACT	TTTCGGGGAA	ATGTGCGCGG
	AAATTGCGCT	TAAAATTGTT	TTATAATTGC	GAATGTTAAA	TCCACCGTGA	AAAGCCCCTT	TACACGCGCC
2801	AACCCCTATT	TGTTTATTT	TCTAAATACA	TTCAAATATG	TATCCGCTCA	TGAGACAATA	ACCCTGATAA
	TTGGGGATAA	ACAAATAAAA	AGATTTATGT	AAGTTTATAC	ATAGGCGAGT	ACTCTGTTAT	TGGGACTATT
2871	ATGCTTCAAT	AATATTGAAA	AAGGAAGAGT	ATGAGTATTC	AACATTTCCG	TGTCGCCCTT	ATTCCCTTTT
	TACGAAGTTA	TTATAACTTT	TTCCTTCTCA	TACTCATAAG	TTGTAAAGGC	ACAGCGGGAA	TAAGGGAAAA
2941	TTGCGGCATT	TTGCCTTCCT	GTTTTTGCTC	ACCCAGAAAC	GCTGGTGAAA	GTAAAAGATG	CTGAAGATCA
	AACGCCGTAA	AACGGAAGGA	CAAAAACGAG	TGGGTCTTTG	CGACCACTTT	CATTTTCTAC	GACTTCTAGT
3011	GTTGGGTGCA	CGAGTGGGTT	ACATCGAACT	GGATCTCAAC	AGCGGTAAGA	TCCTTGAGAG	TTTTCGCCCC
	CAACCCACGT	GCTCACCCAA	TGTAGCTTGA	CCTAGAGTTG	TCGCCATTCT	AGGAACTCTC	AAAAGCGGGG
3081	GAAGAACGTT	TTCCAATGAT	GAGCACTTTT	AAAGTTCTGC	TATGTGGCGC	GGTATTATCC	CGTATTGACG
	CTTCTTGCAA	AAGGTTACTA	CTCGTGAAAA	TTTCAAGACG	ATACACCGCG	CCATAATAGG	GCATAACTGC
3151	CCGGGCAAGA	GCAACTCGGT	CGCCGCATAC	ACTATTCTCA	GAATGACTTG	GTTGAGTACT	CACCAGTCAC
	GGCCCGTTCT	CGTTGAGCCA	GCGGCGTATG	TGATAAGAGT	CTTACTGAAC	CAACTCATGA	GTGGTCAGTG
3221	AGAAAAGCAT TCTTTCGTA	CTTACGGATG GAATGCCTAC	GCATGACAGT CGTACTGTCA	AAGAGAATTA TTCTCTTAAT	TGCAGTGCTG	CCATAACCAT GGTATTGGTA	GAGTGATAAC CTCACTATTG
3291	ACTGCGGCCA	ACTTACTTCT	GACAACGATC	GGAGGACCGA	AGGAGCTAAC	CGCTTTTTTG	CACAACATGG
	TGACGCCGGT	TGAATGAAGA	CTGTTGCTAG	CCTCCTGGCT	TCCTCGATTG	GCGAAAAAAC	GTGTTGTACC
3361	GGGATCATGT	AACTCGCCTT	GATCGTTGGG	AACCGGAGCT	GAATGAAGCC	ATACCAAACG	ACGAGCGTGA
	CCCTAGTACA	TTGAGCGGAA	CTAGCAACCC	TTGGCCTCGA	CTTACTTCGG	TATGGTTTGC	TGCTCGCACT
3431	CACCACGATG	CCTGTAGCAA GGACATCGTT	TGGCAACAAC ACCGTTGTTG	GTTGCGCAAA CAACGCGTTT	CTATTAACTG GATAATTGAC	GCGAACTACT CGCTTGATGA	TACTCTAGCT ATGAGATCGA
3501	TCCCGGCAAC	AATTAATAGA TTAATTATCT	CTGGATGGAG GACCTACCTC	GCGGATAAAG CGCCTATTTC	TTGCAGGACC AACGTCCTGG	ACTTCTGCGC TGAAGACGCG	TCGGCCCTTC AGCCGGGAAG

### FIG.\_44F

### 114 / 154

GATAAATCTG GAGCCGGTGA CTATTTAGAC CTCGGCCACT CCCGTATCGT AGTTATCTAC
•
AATTTTGAAG TAAAAATTAA CTTAACGTGA GTTTTCGTTC GAATTGCACT CAAAAGCAAG
TTTTTTCTG CGCGTAATCT AAAAAAAGAC GCGCATTAGA
GATCAAGAGC TACCAACTCT CTAGTTCTCG ATGGTTGAGA
TTCTAGTGTA GCCGTAGTTA AAGATCACAT CGGCATCAAT
AATCCTGTTA CCAGTGGCTG TTAGGACAAT GGTCACCGAC
TTACCGGATA AGGCGCAGCG AATGGCCTAT TCCGCGTCGC
CCTACACCGA ACTGAGATAC GGATGTGGCT TGACTCTATG
GGACAGGTAT CCGGTAAGCG CCTGTCCATA GGCCATTCGC

# FIG.\_44G

115 / 154

TTGAGCGTCG AACTCGCAGC	TTTACGGTTC AAATGCCAAG	GATAACCGTA CTATTGGCAT	CAGTGAGCGA GTCACTCGCT	ATGCAGCTGG TACGTCGACC	CTCACTCATT GAGTGAGTAA	GATAACAATT CTATTGTTAA	GGAACAAAAG CCTTGTTTTC
CACCTCTGAC GTGGAGACTG	AACGCCAGCA ACGCGGCCTT TTGCGGTCGT TGCGCCGGAA	TGATTCTGTG ACTAAGACAC	AACGACCGAG CGCAGCGAGT CAGTGAGCGA TTGCTGGCTC GCGTCGCTCA GTCACTCGCT	CGATTCATTA GCTAAGTAAT	TGTGAGTTAG ACACTCAATC	ATTGTGAGCG GATAACAATT TAACACTCGC CTATTGTTAA	BSSHII ~~~~~~ CGCCAAGCGC GCAATTAACC CTCACTAAAG GGAACAAAAG GCGGTTCGCG CGTTAATTGG GAGTGATTTC CCTTGTTTTC
CGGGTTTCGC GCCCAAAGCG		CGTTATCCCC GCAATAGGGG		TACGCAAACC GCCTCTCCCC GCGCGTTGGC CGATTCATTA ATGCGTTTGG CGGAGGGG CGCGCAACCG GCTAAGTAAT	ACGCAATTAA TGCGTTAATT	GTTGTGTGGA CAACACACCT	II GCAATTAACC CGTTAATTGG
ATAGTCCTGT TATCAGGACA	CCTATGGAAA GGATACCTTT	TTCTTTCCTG AAGAAAGGAC	GCCGCAGCCG	GCCTCTCCCC	AGTGAGCGCA TCACTCGCGT	CGGCTCGTAT GCCGAGCATA	
TGGTATCTTT ACCATAGAAA	GGGGGGGGAG	TGCTCACATG	GATACCGCTC CTATGGCGAG		GAAAGCGGGC CTTTCGCCCG	TTTATGCTTC AAATACGAAG	TCACACAGGA AACAGCTATG ACCATGATTA AGTGTGTCCT TTGTCGATAC TGGTACTAAT
AGCTTCCAGG GGGAAACGCC TCGAAGGTCC CCCTTTGCGG	ATTTTGTGA TGCTCGTCAG TAAAAACACT ACGAGCAGTC	CTGGCCTTTT GCTGGCCTTT GACCGGAAAA CGACCGGAAA	TGAGTGAGCT	GAGCGCCCAA	CACGACAGGT TTCCCGACTG GTGCTGTCCA AAGGGCTGAC	AGGCACCCCA GGCTTTACAC TCCGTGGGGT CCGAAATGTG	TCACACAGGA AACAGCTATG AGTGTGTCCT TTGTCGATAC
AGCTTCCAGG TCGAAGGTCC	ATTTTTGTGA TAAAAACACT	CTGGCCTTTT GACCGGAAAA	TTACCGCCTT AATGGCGGAA	GGAAGCGGAA CCTTCGCCTT	CACGACAGGT TTC GTGCTGTCCA AAG	AGGCACCCCA TCCGTGGGGT	TCACACAGGA AGTGTGTCCT
4411	4481	4551	4621	4691	4761	4831	4901

FIG.\_44H

ECOR CTGG GACC "Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Targeted

### 116 / 154

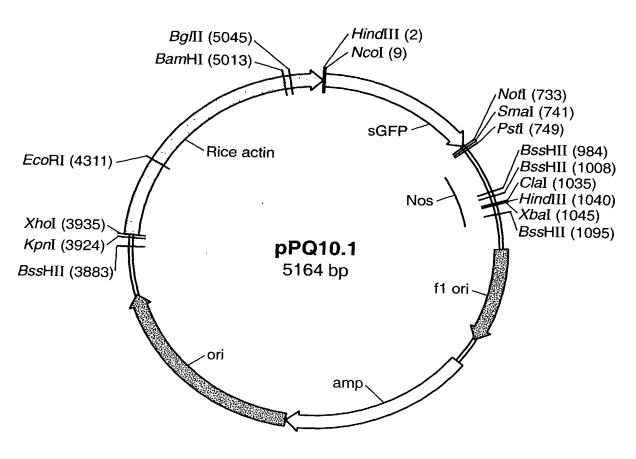


FIG.\_45A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targetch and Digestibility of Plant Cell Walls..."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 117 of 154

### 117 / 154

н	AAGCTTACCA TTCGAATGGT	TGGTGAGCAA ACCACTCGTT	GGGCGAGGAG CCCGCTCCTC	CTGTTCACCG GACAAGTGGC	GGGTGGTGCC	CATCCTGGTC GTAGGACCAG	GAGCTGGACG CTCGACCTGC
71	GCGACGTGAA CGCTGCACTT	CGGCCACAAG GCCGGTGTTC	TTCAGCGTGT AAGTCGCACA	CCGGCGAGGG	CGAGGGCGAT GCTCCCGCTA	GCCACCTACG CGGTGGATGC	GCAAGCTGAC CGTTCGACTG
141	CCTGAAGTTC GGACTTCAAG	ATCTGCACCA TAGACGTGGT	CCGGCAAGCT GGCCGTTCGA	GCCCGTGCCC	TGGCCCACCC	TCGTGACCAC AGCACTGGTG	CTTCACCTAC GAAGTGGATG
211	GGCGTGCAGT	GCTTCAGCCG CGAAGTCGGC	CTACCCCGAC GATGGGGCTG	CACATGAAGC GTGTACTTCG	AGCACGACTT TCGTGCTGAA	CTTCAAGTCC GAAGTTCAGG	GCCATGCCCG CGGTACGGGC
281	AAGGCTACGT TTCCGATGCA	CCAGGAGCGC GGTCCTCGCG	ACCATCTTCT TGGTAGAAGA	TCAAGGACGA AGTTCCTGCT	CGGCAACTAC GCCGTTGATG	AAGACCCGCG TTCTGGGCGC	CCGAGGTGAA GGCTCCACTT
351	GTTCGAGGGC	GACACCCTGG CTGTGGGACC	TGAACCGCAT ACTTGGCGTA	CGAGCTGAAG GCTCGACTTC	GGCATCGACT CCGTAGCTGA	TCAAGGAGGA AGTTCCTCCT	CGGCAACATC GCCGTTGTAG
421	CTGGGGCACA	AGCTGGAGTA TCGACCTCAT	CAACTACAAC GTTGATGTTG	AGCCACAACG TCGGTGTTGC	TCTATATCAT AGATATAGTA	GGCCGACAAG CCGGCTGTTC	CAGAAGAACG GTCTTCTTGC
491	GCATCAAGGT CGTAGTTCCA	GAACTTCAAG CTTGAAGTTC	ATCCGCCACA TAGGCGGTGT	ACATCGAGGA TGTAGCTCCT	CGGCAGCGTG GCCGTCGCAC	CAGCTCGCCG GTCGAGCGGC	ACCACTACCA TGGTGATGGT
561	GCAGAACACC CGTCTTGTGG	CCCATCGGCG GGGTAGCCGC	ACGGCCCCGT	GCTGCTGCCC	GACAACCACT CTGTTGGTGA	ACCTGAGCAC TGGACTCGTG	CCAGTCCGCC GGTCAGGCGG
631	CTGAGCAAAG GACTCGTTTC	ACCCCAACGA TGGGGTTGCT	GAAGCGCGAT CTTCGCGCTA	CACATGGTCC GTGTACCAGG	TGCTGGAGTT ACGACCTCAA	CGTGACCGCC GCACTGGCGG	GCCGGGATCA CGGCCCTAGT

HindIII Ncol

### FIG.\_45B

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall. ."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 118 of 154

118 / 154

				NotI	PstI		
ភូមិ	CTCACGGCAT GAGTGCCGTA	GGACGAGCTG CCTGCTCGAC	TACAAGTAAA ATGTTCATTT	ອອອວອອວວອວ ວວວອວວອອວອ	GGGCTGCAGG CCCGACGTCC	GAAACCACTG CTTTGGTGAC	AAGGATGAGC TTCCTACTCG
Ĕά	TGTAAAGAAG ACATTTCTTC	CAGATCGTTC GTCTAGCAAG	AAACATTTGG TTTGTAAACC	CAATAAAGTT GTTATTTCAA	TCTTAAGATT AGAATTCTAA	GAATCCTGTT CTTAGGACAA	GCCGGTCTTG CGGCCAGAAC
ပေဖ	CGATGATTAT GCTACTAATA	CATATAATTT GTATATTAAA	CTGTTGAATT GACAACTTAA	ACGTTAAGCA TGCAATTCGT	TGTAATAATT ACATTATTAA	AACATGTAAT TTGTACATTA	GCATGACGTT CGTACTGCAA
K; H	ATTTATGAGA TAAATACTCT	TGGGTTTTTA ACCCAAAAAT	TGATTAGAGT ACTAATCTCA	CCCGCAATTA	TACATTTAAT ATGTAAATTA	ACGCGATAGA TGCGCTATCT	AAACAAAATA TTTGTTTTAT
	BSSHII		BssHII	н		~ ClaI HindIII	XbaI ~~~~~
H K	TAGCGCGCAA	ACTAGGATAA TGATCCTATT	ATTATCGCGC GC TAATAGCGCG CG	GCGGTGTCAT	CTATGTTACT GATACAATGA	AGATCGATAA GCTT	GCTTCTAGAG CGAAGATCTC
0 0	CGGCCGGTGG	AGCTCCAATT TCGAGGTTAA	CGCCCTATAG GCGGGATATC	TGAGTCGTAT ACTCAGCATA	BSSHII ~~~~~ TACGCGCGCT ATGCGCGCGA	CACTGGCCGT GTGACCGGCA	CGTTTTACAA GCAAAATGTT
0 0	CGTCGTGACT GCAGCACTGA	GGGAAAACCC CCCTTTTGGG	TGGCGTTACC	CAACTTAATC GTTGAATTAG	GCCTTGCAGC	ACATCCCCCT TGTAGGGGGA	TTCGCCAGCT AAGCGGTCGA
60	GGCGTAATAG CCGCATTATC	CGAAGAGGCC GCTTCTCCGG	CGCACCGATC GCGTGGCTAG	GCCCTTCCCA ACAGTTGCGC CGGGAAGGGT TGTCAACGCG	ACAGTTGCGC TGTCAACGCG	AGCCTGAATG TCGGACTTAC	GCGAATGGGA CGCTTACCCT

# FIG.\_45C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 119 of 154

### 119 / 154

1261	CGCGCCCTGT	AGCGGCGCAT	TAAGCGCGGC	GGGTGTGGTG	GTTACGCGCA CAATGCGCGT	GCGTGACCGC	TACACTTGCC	
1331	AGCGCCCTAG TCGCGGGATC	CGCCCGCTCC	TTTCGCTTTC AAAGCGAAAG	TTCCCTTCCT AAGGGAAGGA	TTCTCGCCAC AAGAGCGGTG	GTTCGCCGGC	TTTCCCCGTC AAAGGGGCAG	•
1401	AAGCTCTAAA TTCGAGATTT	TCGGGGGCTC	CCTTTAGGGT GGAAATCCCA	TCCGATTTAG AGGCTAAATC	TGCTTTACGG ACGAAATGCC	CACCTCGACC GTGGAGCTGG	CCAAAAAACT GGTTTTTTGA	
1471	TGATTAGGGT ACTAATCCCA	GATGGTTCAC CTACCAAGTG	GTAGTGGGCC CATCACCCGG	ATCGCCCTGA TAGCGGGACT	TAGACGGTTT ATCTGCCAAA	TTCGCCCTTT AAGCGGGAAA	GACGTTGGAG CTGCAACCTC	
1541	TCCACGTTCT AGGTGCAAGA	TTAATAGTGG AATTATCACC	ACTCTTGTTC TGAGAACAAG	CAAACTGGAA GTTTGACCTT	CAACACTCAA GTTGTGAGTT	CCCTATCTCG GGGATAGAGC	GTCTATTCTT CAGATAAGAA	
1611	TTGATTTATA AACTAAATAT	AGGGATTTTG TCCCTAAAAC	CCGATTTCGG GGCTAAAGCC	CCTATTGGTT GGATAACCAA	AAAAAATGAG TTTTTTACTC	CTGATTTAAC GACTAAATTG	AAAATTTAA TTTTAAATT	
1681	CGCGAATTTT GCGCTTAAAA	AACAAAATAT TTGTTTTATA	TAACGCTTAC ATTGCGAATG	AATTTAGGTG TTAAATCCAC	GCACTTTTCG CGTGAAAAGC	GGGAAATGTG CCCTTTACAC	CGCGGAACCC	
1751	CTATTTGTTT GATAAACAAA	ATTTTCTAA TAAAAGATT	ATACATTCAA TATGTAAGTT	ATATGTATCC TATACATAGG	GCTCATGAGA CGAGTACTCT	CAATAACCCT GTTATTGGGA	GATAAATGCT CTATTTACGA	
1821	TCAATAATAT AGTTATTATA	TGAAAAAGGA ACTTTTTCCT	AGAGTATGAG TCTCATACTC	TATTCAACAT ATAAGTTGTA	TTCCGTGTCG AAGGCACAGC	CCCTTATTCC GGGAATAAGG	CTTTTTTGCG GAAAAAACGC	
1891	GCATTTTGCC CGTAAAACGG	TTCCTGTTTT AAGGACAAAA	TGCTCACCCA	GAAACGCTGG CTTTGCGACC	TGAAAGTAAA ACTTTCATTT	AGATGCTGAA TCTACGACTT	GATCAGTTGG CTAGTCAACC	
1961	GTGCACGAGT CACGTGCTCA	GGGTTACATC CCCAATGTAG	GAACTGGATC CTTGACCTAG	TCAACAGCGG AGTTGTCGCC	TAAGATCCTT ATTCTAGGAA	GAGAGTTTTC CTCTCAAAAG	GCCCCGAAGA	
2031	ACGTTTTCCA TGCAAAAGGT	ATGATGAGCA TACTACTCGT	CTTTTAAAGT GAAATTTCA	TCTGCTATGT AGACGATACA	GGCGCGGTAT	TATCCCGTAT ATAGGGCATA	TGACGCCGGG ACTGCGGCCC	

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Digestibility of Plant Cell Walls by Targeted Digestibility of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 120 of 154

120 / 154

2101	CAAGAGCAAC GTTCTCGTTG	TCGGTCGCCG	CATACACTAT GTATGTGATA	TCTCAGAATG AGAGTCTTAC	ACTTGGTTGA TGAACCAACT	GTACTCACCA CATGAGTGGT	GTCACAGAAA CAGTGTCTTT
2171	AGCATCTTAC	GGATGGCATG	ACAGTAAGAG	AATTATGCAG	TGCTGCCATA	ACCATGAGTG	ATAACACTGC
	TCGTAGAATG	CCTACCGTAC	TGTCATTCTC	TTAATACGTC	ACGACGGTAT	TGGTACTCAC	TATTGTGACG
2241	GGCCAACTTA	CTTCTGACAA	CGATCGGAGG	ACCGAAGGAG	CTAACCGCTT	TTTTGCACAA	CATGGGGGAT
	CCGGTTGAAT	GAAGACTGTT	GCTAGCCTCC	TGGCTTCCTC	GATTGGCGAA	AAAACGTGTT	GTACCCCCTA
2311	CATGTAACTC	GCCTTGATCG	TTGGGAACCG	GAGCTGAATG	AAGCCATACC	AAACGACGAG	CGTGACACCA
	GTACATTGAG	CGGAACTAGC	AACCCTTGGC	CTCGACTTAC	TTCGGTATGG	TTTGCTGCTC	GCACTGTGGT
2381	CGATGCCTGT	AGCAATGGCA	ACAACGTTGC	GCAAACTATT	AACTGGCGAA	CTACTTACTC	TAGCTTCCCG
	GCTACGGACA	TCGTTACCGT	TGTTGCAACG	CGTTTGATAA	TTGACCGCTT	GATGAATGAG	ATCGAAGGGC
2451	GCAACAATTA	ATAGACTGGA	TGGAGGCGGA	TAAAGTTGCA	GGACCACTTC	TGCGCTCGGC	CCTTCCGGCT
	CGTTGTTAAT	TATCTGACCT	ACCTCCGCCT	ATTTCAACGT	CCTGGTGAAG	ACGCGAGCCG	GGAAGGCCGA
2521	GGCTGGTTTA	TTGCTGATAA	ATCTGGAGCC	GGTGAGCGTG	GGTCTCGCGG	TATCATTGCA	GCACTGGGGC
	CCGACCAAAT	AACGACTATT	TAGACCTCGG	CCACTCGCAC	CCAGAGCGCC	ATAGTAACGT	CGTGACCCCG
2591	CAGATGGTAA GTCTACCATT	GCCCTCCCGT	ATCGTAGTTA TAGCATCAAT	TCTACACGAC AGATGTGCTG	GGGGAGTCAG CCCCTCAGTC	GCAACTATGG CGTTGATACC	ATGAACGAAA TACTTGCTTT
2661	TAGACAGATC ATCTGTCTAG	GCTGAGATAG CGACTCTATC	GTGCCTCACT	GATTAAGCAT CTAATTCGTA	TGGTAACTGT ACCATTGACA	CAGACCAAGT GTCTGGTTCA	TTACTCATAT AATGAGTATA
2731	ATACTTTAGA	TTGATTTAAA	ACTTCATTTT	TAATTTAAAA	GGATCTAGGT	GAAGATCCTT	TTTGATAATC
	TATGAAATCT	AACTAAATTT	TGAAGTAAAA	ATTAAATTTT	CCTAGATCCA	CTTCTAGGAA	AAACTATTAG
2801	TCATGACCAA	AATCCCTTAA	CGTGAGTTTT	CGTTCCACTG	AGCGTCAGAC	CCCGTAGAAA	<b>AGATCAAAGG</b>
	AGTACTGGTT	TTAGGGAATT	GCACTCAAAA	GCAAGGTGAC	TCGCAGTCTG	GGGCATCTTT	TCTAGTTTCC
2871	ATCTTCTTGA TAGAAGAACT	GATCCTTTTT CTAGGAAAAA	TTCTGCGCGT AAGACGCGCA	AATCTGCTGC TTAGACGACG	TTGCAAACAA AACGTTTGTT	AAAACCACC TTTTTGGTGG	GCTACCAGCG

# FIG.\_45E

### 121 / 154

ਲਾ ਹੈ ।	GTGGTTTGTT	TGCCGGATCA	AGAGCTACCA TCTCGATGGT	ACTCTTTTTC TGAGAAAAAG	CGAAGGTAAC GCTTCCATTG	TGGCTTCAGC	AGAGCGCAGA TCTCGCGTCT
TACCAAATAC	AC	TGTCCTTCTA	GTGTAGCCGT	AGTTAGGCCA	CCACTTCAAG	AACTCTGTAG	CACCGCCTAC
ATGGTTTATG	TG	ACAGGAAGAT	CACATCGGCA	TCAATCCGGT	GGTGAAGTTC	TTGAGACATC	GTGGCGGATG
ATACCTCGCT	GA	CTGCTAATCC	TGTTACCAGT	GGCTGCTGCC	AGTGGCGATA	AGTCGTGTCT	TACCGGGTTG
TATGGAGCGA		GACGATTAGG	ACAATGGTCA	CCGACGACGG	TCACCGCTAT	TCAGCACAGA	ATGGCCCAAC
GACTCAAGAC	AAC	GATAGTTACC	GGATAAGGCG	CAGCGGTCGG	GCTGAACGGG	GGGTTCGTGC	ACACAGCCCA
CTGAGTTCTG	TG	CTATCAATGG	CCTATTCCGC	GTCGCCAGCC	CGACTTGCCC	CCCAAGCACG	TGTGTCGGGT
GCTTGGAGCG	မှ ည	AACGACCTAC	ACCGAACTGA	GATACCTACA	GCGTGAGCTA	TGAGAAAGCG	CCACGCTTCC
CGAACCTCGC	ပို့ ည	TTGCTGGATG	TGGCTTGACT	CTATGGATGT	CGCACTCGAT	ACTCTTTCGC	GGTGCGAAGG
CGAAGGGAGA	AGA	AAGGCGGACA	GGTATCCGGT	AAGCGGCAGG	GTCGGAACAG	GAGAGCGCAC	GAGGGAGCTT
GCTTCCCTCT		TTCCGCCTGT	CCATAGGCCA	TTCGCCGTCC	CAGCCTTGTC	CTCTCGCGTG	CTCCCTCGAA
CCAGGGGGAA	GAA	ACGCCTGGTA	TCTTTATAGT	CCTGTCGGGT	TTCGCCACCT	CTGACTTGAG	CGTCGATTTT
GGTCCCCCTT		TGCGGACCAT	AGAAATATCA	GGACAGCCCA	AAGCGGTGGA	GACTGAACTC	GCAGCTAAAA
TGTGATGCTC	CTC	GTCAGGGGGG	CGGAGCCTAT	GGAAAAACGC	CAGCAACGCG	GCCTTTTTAC	GGTTCCTGGC
ACACTACGAG		CAGTCCCCCC	GCCTCGGATA	CCTTTTTGCG	GTCGTTGCGC	CGGAAAAATG	CCAAGGACCG
CTTTTGCTGG	TGG	CCTTTTGCTC	ACATGTTCTT	TCCTGCGTTA	TCCCCTGATT	CTGTGGATAA	CCGTATTACC
GAAACGACC		GGAAAACGAG	TGTACAAGAA	AGGACGCAAT	AGGGGACTAA	GACACCTATT	GGCATAATGG
GCCTTTGAGT	AGT	GAGCTGATAC	CGCTCGCCGC	AGCCGAACGA	CCGAGCGCAG	CGAGTCAGTG	AGCGAGGAAG
CGGAAACTCA	TCA	CTCGACTATG		TCGGCTTGCT	GGCTCGCGTC	GCTCAGTCAC	TCGCTCCTTC
CGGAAGAGCG GCCTTCTCGC	၁၅၁	CCCAATACGC GGGTTATGCG	AAACCGCCTC TTTGGCGGAG	TCCCCGCGCG AGGGGCGCGC	TTGGCCGATT AACCGGCTAA	CATTAATGCA GTAATTACGT	GCTGGCACGA
CAGGTTTCCC	)	GACTGGAAAG	CGGGCAGTGA	GCGCAACGCA	ATTAATGTGA	GTTAGCTCAC	TCATTAGGCA
GTCCAAAGGG	999	CTGACCTTTC	GCCCGTCACT		TAATTACACT	CAATCGAGTG	AGTAATCCGT

# FIG.\_45F

### 122 / 154

3781	CCCCAGGCTT GGGGTCCGAA	TACACTTTAT ATGTGAAATA	GCTTCCGGCT	CGTATGTTGT GCATACAACA	GTGGAATTGT CACCTTAACA	GAGCGGATAA CTCGCCTATT	CAATTTCACA GTTAAAGTGT
3851	CAGGAAACAG GTCCTTTGTC	CTATGACCAT GATACTGGTA	GATTACGCCA CTAATGCGGT	BSSHII ~~~~~~AGCGCGCAAT TCGCGCGTTA	TAACCCTCAC	TAAAGGGAAC ATTTCCCTTG	Kpni ~~ AAAAGCTGGG TTTTCGACCC
3921	KpnI ~~~~ TACCGGGCCC ATGGCCCGGG	Xhol ~~~~~ CCCCTCGAGG GGGGAGCTCC	TCATTCATAT AGTAAGTATA	GCTTGAGAAG CGAACTCTTC	AGAGTCGGGA TCTCAGCCCT	TAGTCCAAAA ATCAGGTTTT	TAAAACAAAG ATTTTGTTTC
3991	GTAAGATTAC	CTGGTCAAAA	GTGAAAACAT	CAGTTAAAAG	GTGGTATAAG	TAAAATATCG	GTAATAAAAG
	CATTCTAATG	GACCAGTTTT	CACTTTTGTA	GTCAATTTTC	CACCATATTC	ATTTTATAGC	CATTATTTTC
4061	GTGGCCCAAA	GTGAAATTTA	CTCTTTTCTA	CTATTATAAA	AATTGAGGAT	GTTTTGTCGG	TACTTTGATA
	CACCGGGTTT	CACTTTAAAT	GAGAAAGAT	GATAATATTT	TTAACTCCTA	CAAACAGCC	ATGAAACTAT
4131	CGTCATTTT	GTATGAATTG	GTTTTTAAGT	TTATTCGCGA	TTTGGAAATG	CATATCTGTA	TTTGAGTCGG
	GCAGTAAAAA	CATACTTAAC	CAAAAATTCA	AATAAGCGCT	AAACCTTTAC	GTATAGACAT	AAACTCAGCC
4201	TTTTTAAGTT	CGTTGCTTTT	GTAAATACAG	AGGGATTTGT	ATAAGAAATA	TCTTTAAAAA	ACCCATATGC
	AAAAATTCAA	GCAACGAAAA	CATTTATGTC	TCCCTAAACA	TATTCTTTAT	AGAAATTTTT	TGGGTATACG
4271	TAATTTGACA ATTAAACTGT	TAATTTTGA ATTAAAAACT	GААААТАТА СТТТТТАТАТ	TATTCAGGCG ATAAGTCCGC	ECORI	TGAACAATAA ACTTGTTATT	TAAGATTAAA ATTCTAATTT
4341	ATAGCTTGCC	CCCGTTGCAG	CGATGGGTAT	TTTTTCTAGT	AAAATAAAAG	ATAAACTTAG	ACTCAAAACA
	TATCGAACGG	GGGCAACGTC	GCTACCCATA	AAAAAGATCA	TTTTATTTTC	TATTTGAATC	TGAGTTTTGT
4411	TTTACAAAAA AAATGTTTTT	CAACCCCTAA GTTGGGGGATT	AGTCCTAAAG TCAGGATTTC	CCCAAAGTGC GGGTTTCACG	TATGCACGAT ATACGTGCTA	CCATAGCAAG GGTATCGTTC	CCCAGCCCAA

# FIG.\_45G

### 123 / 154

CTATCACCGT GATAGTGGCA	AAAAGAAAA TTTTCTTTTT	ວວວອອວວວ	CCCATCCCCC	TCCCCCTCC	TCGTCTCGGT AGCAGAGCCA	CGCGGGAGGG	GGCTCTCGGA CCGAGAGCCT	CGGTAGTTTT GCCATCAAAA	
ACCCCGGCA TGGGGGCCGT	AAAAAAAGA TTTTTTTCT	GCAGCGACGA	CCCCTCTCCT GGGGAGAGGA	GACGAGCTCC CTGCTCGAGG	GTTTTTTTT CAAAAAAAA	CAGATCGGTG GTCTAGCCAC	CGGGGAATGG GCCCCTTACC	CATTGTTCAT GTAACAAGTA	GTAG CATC
AATAGTCTCC TTATCAGAGG	AAAAAGAAAG TTTTTCTTTC	AGGATCGCGA TCCTAGCGCT	TACATACCCC ATGTATGGGG	GCTGCCGGAC CGACGGCCTG	TTCTTTCTCC AAGAAAGAGG	CTTCGTCGCC GAAGCAGCGG	BamHI ~~~~~ CGGATCCTCG GCCTAGGAGC	AATCCCTCAG TTAGGGAGTC	TTTTTTGTAG AAAAAACATC
CCAACTGGCA GGTTGACCGT	CCAAAAAAA GGTTTTTTTT	AAAAGCGAGG TTTTCGCTCC	CGCCACTATA GCGGTGATAT	CTCCCCCTC	CCTCTCCTCT GGAGAGGAGA	GCGAGAGCGG CGCTCTCGCC	TGAGTCGGCC ACTCAGCCGG	GTAGAATTTG CATCTTAAAC	CGTGCGGAGC
CCCAGTGCAG GGGTCACGTC	CGTCTCGCAG GCAGAGCGTC	TGGGGGCCGG	CGCCCCCCAT	CCACCACCTC GGTGGTGGAG	CCACCCCGCC	GTTTGGGTGG CAAACCCACC	TCTCCGGGCG	TCTTTTGTG AGAAAAACAC	AATGCAGCCT TTACGTCGGA
CCCAACCCAC	CACCACCGCA GTGGTGGCGT	GTCCGGGTCG	TCCAAAGAAA AGGTTTCTTT	ACCACCACCA TGGTGGTGGT	CCGCCGGTAA GGCGGCCATT	GGCCTTGGTA CCGGAACCAT	GCGGCTGGCG	CTTTCTTTCT GAAAGAAAGA	ATTTGTGACA TAAACACTGT
CCCAACCCAA GGGTTGGGTT	GAGTTGTCCG CTCAACAGGC	CAGCAGGTGG GTCGTCCACC	TCCCTCCGCT AGGGAGGCGA	CAACCCTACC GTTGGGATGG	CCCTCCGCCG	CTCGATCTTT GAGCTAGAAA	GCGGGATCTC CGCCCTAGAG	Bglii ~~~~~ TGTAGATCTT ACATCTAGAA	TCTTTTCATG
4481	4551	4621	4691	4761	4831	4901	4971	5041	5111

### FIG.\_45H

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Pargeted Frageted Frageted

124 / 154

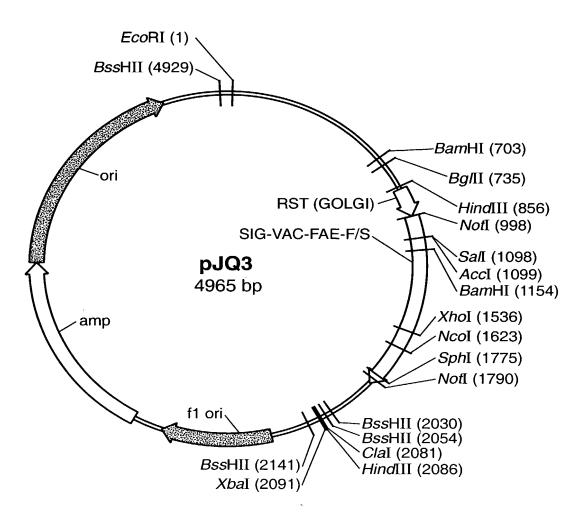


FIG.\_46A

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted 1 Public Plant Cell Walls By Targeted 1 Public Plant Cell Walls By Targeted 1 Public Plant Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 125 of 154

125 / 154

H	AATTCCACAA TTAAGGTGTT	TGAACAATAA ACTTGTTATT	TAAGATTAAA ATTCTAATTT	ATAGCTTGCC TATCGAACGG	CCCGTTGCAG	CGATGGGTAT GCTACCCATA	TTTTTCTAGT AAAAAGATCA
71	AAAATAAAAG TTTTATTTTC	ATAAACTTAG TATTTGAATC	ACTCAAAACA TGAGTTTTGT	TTTACAAAAA AAATGTTTTT	CAACCCCTAA GTTGGGGATT	AGTCCTAAAG TCAGGATTTC	CCCAAAGTGC GGGTTTCACG
141	TATGCACGAT ATACGTGCTA	CCATAGCAAG GGTATCGTTC	CCCAGCCCAA	CCCAACCCAA	CCCAACCCAC	CCCAGTGCAG GGGTCACGTC	CCAACTGGCA GGTTGACCGT
211	AATAGTCTCC TTATCAGAGG	ACCCCCGGCA TGGGGGCCGT	CTATCACCGT GATAGTGGCA	GAGTTGTCCG CTCAACAGGC	CACCACCGCA GTGGTGGCGT	CGTCTCGCAG GCAGAGCGTC	CCAAAAAAA GGTTTTTTT
281	AAAAAGAAAG TTTTTCTTTC	AAAAAAAGA TTTTTTTTCT	AAAAGAAAA TTTTCTTTTT	CAGCAGGTGG GTCGTCCACC	GTCCGGGTCG	TGGGGGCCGG ACCCCCGGCC	AAAAGCGAGG TTTTCGCTCC
351	AGGATCGCGA TCCTAGCGCT	GCAGCGACGA	ອອອວວອອອວວ ວວວອອວວວວອອ	TCCCTCCGCT AGGGAGGCGA	TCCAAAGAAA AGGTTTCTTT	CGCCCCCCAT	CGCCACTATA GCGGTGATAT
421	TACATACCCC	CCCCTCTCCT GGGGAGAGGA	CCCATCCCCC GGGTAGGGGG	CAACCCTACC GTTGGGATGG	ACCACCACCA TGGTGGTGGT	CCACCACCTC GGTGGTGGAG	CTCCCCCTC
491	GCTGCCGGAC CGACGGCCTG	GACGAGCTCC	TCCCCCCTCC	CCCTCCGCCG	CCGCCGGTAA GGCGGCCATT	CCACCCGCC	CCTCTCCTCT GGAGAGGAGA
561	TTCTTTCTCC AAGAAAGAGG	GTTTTTTTT CAAAAAAAA	TCGTCTCGGT AGCAGAGCCA	CTCGATCTTT GAGCTAGAAA	GGCCTTGGTA CCGGAACCAT	GTTTGGGTGG CAAACCCACC	GCGAGAGCGG CGCTCTCGCC
631	CTTCGTCGCC	CAGATCGGTG GTCTAGCCAC	CGCGGGAGGG	GCGGGATCTC CGCCCTAGAG	GCGGCTGGCG CGCCGACCGC	TCTCCGGGCG AGAGGCCCGC	TGAGTCGGCC ACTCAGCCGG
701	BamHI ~~~~~ CGGATCCTCG GCCTAGGAGC	CGGGGAATGG	GGCTCTCGGA CCGAGAGCCT	Bglii ~~~~~ TGTAGATCTT ACATCTAGAA	CTTTCTTTCT GAAAGAAGA	TCTTTTGTG AGAAAAACAC	GTAGAATTTG CATCTTAAAC

ECORI

### 126 / 154

CGTGCGGAGC GCACGCCTCG		AGTAGGAGCA CCTCCAAGCC GGAGGTTCGG	TTAGTCGAAA AATCAGCTTT			AGGGAGAGAA TCCCTCTCTT		AATAATCACC TTATTAGTGG	CCTTTCGACA	TCCAGGACCA AGGTCCTGGT
AATGCAGCCT		TCCGACTACG AGGCCCTCAC AGGCTGATG TCCGGGAGTG	CTACAGCCGT GATGTCGGCA	ы	₹ } ⊔	ACTATTATCA TGATAATAGT		GCAGCAAAGA CGTCGTTTCT	CACCCTCACG GTGGGAGTGC	TGGGTCTCCG ACCCAGAGGC
ATTTGTGACA			CCGAAGACCT GGCTTCTGGA	Salı	ACCI	CATTCCGTCG AC GTAAGGCAGC TG		CGCGACGACA	ATACTAACTA TATGATTGAT	TTATATTGGA AATATAACCT
TCTTTTCATG AGAAAAGTAC	ACACCAACCT		CAGGGCATCT GTCCCGTAGA			ACCTGTGCAA TGGACACGTT	BamHI	ATGGATCCTC TACCTAGGAG	CTACAACTCG GATGTTGAGC	ACGGTGGATA TGCCACCTAT
CGGTAGTTTT	I ACCATGATCC TGGTACTAGG		I CGCCTCCACG GCGGAGGTGC			GCCTACGCCG CGGATGCGGC		ACATTAACGG TGTAATTGCC	TGATACGAAT ACTATGCTTA	TGTGAAGTAC ACACTTCATG
CATTGTTCAT GTAACAAGTA	HindIII ~~~~~ GTAGAAGCTT. CATCTTCGAA		Noti AAATGGCGGC CGC TTTACCGCCG GCG			CTCCCAAGCT GAGGGTTCGA		TCTCAAACTG AGAGTTTGAC	GCACTGGTAG CGTGACCATC	
AATCCCTCAG TTAGGGAGTC	TTTTTGTAG AAAAAACATC	CTTCCTCCTC	AAGGAGTTCC TTCCTCAAGG			TGGCCACTAT ACCGGTGATA		AATTTACAAT TTAAATGTTA	GTCTTCCGTG CAGAAGGCAC	CCCTACCACA ATGCAACGGT GGGATGGTGT TACGTTGCCA
771	841	911	981			1051		1121	1191	1261

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted 1 Targeted 1 Targeted 2 Targeted 2 Targeted 2 Targeted 2 Targeted 3 Targ

127 / 154

1331	AGTCGAGTCG TCAGCTCAGC	CTTGTCAAAC GAACAGTTTG	AGCAGGTTAG TCGTCCAATC	CCAGTATCCG GGTCATAGGC	GACTACGCGC CTGATGCGCG	TGACCGTGAC ACTGGCACTG	CGGCCACKCC
1401	CTCGGCGCCT	CCCTGGCGGC	ACTCACTGCC TGAGTGACGG	GCCCAGCTGT CGGGTCGACA	CTGCGACATA GACGCTGTAT	CGACAACATC GCTGTTGTAG	CGCCTGTACA GCGGACATGT
1471	CCTTCGGCGA GGAAGCCGCT	ACCGCGCAGC	GGCAATCAGG CCGTTAGTCC	CCTTCGCGTC GGAAGCGCAG	GTACATGAAC CATGTACTTG	GATGCCTTCC CTACGGAAGG	XhoI ~~~~~ AAGCCTCGAG TTCGGAGCTC
1541	CCCAGATACG GGGTCTATGC	ACGCAGTATT TGCGTCATAA	TCCGGGTCAC AGGCCCAGTG	TCATGCCAAC AGTACGGTTG	GACGGCATCC CTGCCGTAGG	CAAACCTGCC GTTTGGACGG	CCCGGTGGAG GGGCCACCTC
1611	CAGGGGTACG GTCCCCATGC	Ncol CCCATGGCGG GGGTACCGCC	TGTAGAGTAC ACATCTCATG	TGGAGCGTTG ACCTCGCAAC	ATCCTTACAG TAGGAATGTC	CGCCCAGAAC GCGGGTCTTG	ACATTTGTCT TGTAAACAGA
1681	GCACTGGGGA CGTGACCCCT	TGAAGTGCAG ACTTCACGTC	TGCTGTGAGG ACGACACTCC	CCCAGGGCGG	ACAGGGTGTG TGTCCCACAC	AATAATGCGC TTATTACGCG	ACACGACTTA TGTGCTGAAT
1751	TTTTGGGATG AAACCCTAC	ACGAGCGGCG TGCTCGCCGC	Sphi ~~~~~~ CATGCACCTG GTACGTGGAC	No ~~~ GCCGGTCGCG CGGCCAGCGC	NotI  GCG GCCGCGGAAA CGC CGGCGCCTTT	CCACTGAAGG GGTGACTTCC	ATGAGCTGTA TACTCGACAT
1821	AAGAAGCAGA TTCTTCGTCT	TCGTTCAAAC AGCAAGTTTG	ATTTGGCAAT TAAACCGTTA	AAAGTTTCTT TTTCAAAGAA	AAGATTGAAT TTCTAACTTA	CCTGTTGCCG	GTCTTGCGAT CAGAACGCTA
1891	GATTATCATA CTAATAGTAT	TAATTTCTGT ATTAAAGACA	TGAATTACGT ACTTAATGCA	TAAGCATGTA ATTCGTACAT	ATAATTAACA TATTAATTGT	TGTAATGCAT ACATTACGTA	GACGTTATTT CTGCAATAAA

# FIG.\_46D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted | The Phenolic Acid Content and Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 128 of 154

128 / 154

1961	ATGAGATGGG TACTCTACCC	TTTTTATGAT AAAAATACTA	TAGAGTCCCG ATCTCAGGGC	CAATTATACA GTTAATATGT	TTTAATACGC AAATTATGCG	GATAGAAAAC CTATCTTTG	AAAATATAGC TTTTATATCG
	BssHII	٠	Bsshii		2	~~ ClaI HindIII	XbaI ~~~~~~ II
2031	GCGCAAACTA CGCGTTTGAT	GGATAAATTA CCTATTTAAT	TCGCGCGCGG	TGTCATCTAT ACAGTAGATA	GTTACTAGAT CGATAAGCTT CAATGATCTA GCTATTCGAA	CGATAAGCTT	CTAGAGCGGC GATCTCGCCG
				B	BSSHII		
2101	CGGTGGAGCT	CCAATTCGCC GGTTAAGCGG	CTATAGTGAG GATATCACTC	TCGTATTACG CGCGCTCACT AGCATAATGC GCGCGAGTGA	CGCGCTCACT	GGCCGTCGTT CCGGCAGCAA	TTACAACGTC AATGTTGCAG
2171	GTGACTGGGA CACTGACCCT	AAACCCTGGC TTTGGGACCG	GTTACCCAAC CAATGGGTTG	TTAATCGCCT AATTAGCGGA	TGCAGCACAT ACGTCGTGTA	CCCCCTTTCG GGGGGAAAGC	CCAGCTGGCG
2241	TAATAGCGAA ATTATCGCTT	GAGGCCCGCA CTCCGGGCGT	CCGATCGCCC	TTCCCAACAG AAGGGTTGTC	TTGCGCAGCC AACGCGTCGG	TGAATGGCGA ACTTACCGCT	ATGGGACGCG TACCCTGCGC
2311	CCCTGTAGCG	GCGCATTAAG CGCGTAATTC	CGCGGCGGGT	GTGGTGGTTA CACCACCAAT	CGCGCAGCGT GCGCGTCGCA	GACCGCTACA CTGGCGATGT	CTTGCCAGCG GAACGGTCGC
2381	CCCTAGCGCC	CGCTCCTTTC GCGAGGAAAG	GCTTTCTTCC CGAAAGAAGG	CTTCCTTTCT GAAGGAAAGA	CGCCACGTTC GCGGTGCAAG	GCCGGCTTTC CGGCCGAAAG	CCCGTCAAGC GGGCAGTTCG
2451	TCTAAATCGG AGATTTAGCC	GGGCTCCCTT CCCGAGGGAA	TAGGGTTCCG ATCCCAAGGC	ATTTAGTGCT TAAATCACGA	TTACGGCACC AATGCCGTGG	TCGACCCCAA	AAAACTTGAT TTTTGAACTA
2521	TAGGGTGATG ATCCCACTAC	GTTCACGTAG CAAGTGCATC	TGGGCCATCG ACCCGGTAGC	CCCTGATAGA GGGACTATCT	CGGTTTTTCG GCCAAAAAGC	CCCTTTGACG GGGAAACTGC	TTGGAGTCCA AACCTCAGGT

### -1G.\_46E

### 129 / 154

2591	CGTTCTTTAA	TAGTGGACTC	TTGTTCCAAA	CTGGAACAAC	ACTCAACCCT	ATCTCGGTCT	ATTCTTTTGA
	GCAAGAAATT	ATCACCTGAG	AACAAGGTTT	GACCTTGTTG	TGAGTTGGGA	TAGAGCCAGA	TAAGAAAACT
2661	TTTATAAGGG	ATTTTGCCGA	TTTCGGCCTA	TTGGTTAAAA	AATGAGCTGA	TTTAACAAAA	ATTTAACGCG
	AAATATTCCC	TAAAACGGCT	AAAGCCGGAT	AACCAATTTT	TTACTCGACT	AAATTGTTTT	TAAATTGCGC
2731	AATTTTAACA TTAAAATTGT	AAATATTAAC TTTATAATTG	GCTTACAATT CGAATGTTAA	TAGGTGGCAC	<b>TTTTCGGGGA</b> AAAAGCCCCT	AATGTGCGCG TTACACGCGC	GAACCCCTAT CTTGGGGATA
2801	TTGTTTATTT	TTCTAAATAC	ATTCAAATAT	GTATCCGCTC	ATGAGACAAT	AACCCTGATA	aatgcttcaa
	AACAAATAAA	AAGATTTATG	TAAGTTTATA	CATAGGCGAG	TACTCTGTTA	TTGGGACTAT	ttacgaagtt
2871	TAATATTGAA ATTATAACTT	AAAGGAAGAG TTTCCTTCTC	TATGAGTATT ATACTCATAA	CAACATTTCC GTTGTAAAGG	GTGTCGCCCT	TATTCCCTTT ATAAGGGAAA	tttgcggcat Aaacgccgta
2941	TTTGCCTTCC	TGTTTTTGCT	CACCCAGAAA	CGCTGGTGAA	AGTAAAAGAT	GCTGAAGATC	AGTTGGGTGC
	AAACGGAAGG	ACAAAAACGA	GTGGGTCTTT	GCGACCACTT	TCATTTTCTA	CGACTTCTAG	TCAACCCACG
3011	ACGAGTGGGT	TACATCGAAC	TGGATCTCAA	CAGCGGTAAG	ATCCTTGAGA	GTTTTCGCCC	CGAAGAACGT
	TGCTCACCCA	ATGTAGCTTG	ACCTAGAGTT	GTCGCCATTC	TAGGAACTCT	CAAAAGCGGG	GCTTCTTGCA
3081	TTTCCAATGA	TGAGCACTTT	TAAAGTTCTG	CTATGTGGCG	CGGTATTATC	CCGTATTGAC	GCCGGGCAAG
	AAAGGTTACT	ACTCGTGAAA	ATTTCAAGAC	GATACACCGC	GCCATAATAG	GGCATAACTG	CGGCCCGTTC
3151	AGCAACTCGG	TCGCCGCATA	CACTATTCTC	AGAATGACTT	GGTTGAGTAC	TCACCAGTCA	CAGAAAGCA
	TCGTTGAGCC	AGCGCGCATAT	GTGATAAGAG	TCTTACTGAA	CCAACTCATG	AGTGGTCAGT	GTCTTTTCGT
3221	TCTTACGGAT	GGCATGACAG	TAAGAGAATT	ATGCAGTGCT	GCCATAACCA	TGAGTGATAA	CACTGCGGCC
	AGAATGCCTA	CCGTACTGTC	ATTCTCTTAA	TACGTCACGA	CGGTATTGGT	ACTCACTATT	GTGACGCCGG
3291	AACTTACTTC	TGACAACGAT	CGGAGGACCG	AAGGAGCTAA	CCGCTTTTTT	GCACAACATG	GGGGATCATG
	TTGAATGAAG	ACTGTTGCTA	GCCTCCTGGC	TTCCTCGATT	GGCGAAAAAA	CGTGTTGTAC	CCCCTAGTAC
3361	TAACTCGCCT ATTGAGCGGA	TGATCGTTGG	GAACCGGAGC CTTGGCCTCG	TGAATGAAGC ACTTACTTCG	CATACCAAAC GTATGGTTTG	GACGAGCGTG CTGCTCGCAC	ACACCACGAT TGTGGTGCTA

### FIG.\_46F

### 130 / 154

3431	GCCTGTAGCA CGGACATCGT	ATGGCAACAA TACCGTTGTT	CGTTGCGCAA GCAACGCGTT	ACTATTAACT TGATAATTGA	GGCGAACTAC	TTACTCTAGC AATGAGATCG	TTCCCGGCAA AAGGGCCGTT
3501	CAATTAATAG GTTAATTATC	ACTGGATGGA TGACCTACCT	GGCGGATAAA CCGCCTATTT	GTTGCAGGAC CAACGTCCTG	CACTTCTGCG GTGAAGACGC	CTCGGCCCTT	CCGGCTGGCT
3571	GGTTTATTGC	TGATAAATCT	GGAGCCGGTG	AGCGTGGGTC	TCGCGGTATC	ATTGCAGCAC	TGGGGCCAGA
	CCAAATAACG	ACTATTTAGA	CCTCGGCCAC	TCGCACCCAG	AGCGCCATAG	TAACGTCGTG	ACCCCGGTCT
3641	TGGTAAGCCC	TCCCGTATCG	TAGTTATCTA	CACGACGGGG	AGTCAGGCAA	CTATGGATGA	ACGAAATAGA
	ACCATTCGGG	AGGGCATAGC	ATCAATAGAT	GTGCTGCCCC	TCAGTCCGTT	GATACCTACT	TGCTTTATCT
3711	CAGATCGCTG	AGATAGGTGC	CTCACTGATT	AAGCATTGGT	AACTGTCAGA	CCAAGTTTAC	TCATATATAC
	GTCTAGCGAC	TCTATCCACG	GAGTGACTAA	TTCGTAACCA	TTGACAGTCT	GGTTCAAATG	AGTATATATG
3781	TTTAGATTGA	TTTAAAACTT	CATTTTTAAT	TTAAAAGGAT	CTAGGTGAAG	ATCCTTTTTG	ATAATCTCAT
	AAATCTAACT	AAATTTTGAA	GTAAAAATTA	AATTTTCCTA	GATCCACTTC	TAGGAAAAAC	TATTAGAGTA
3851	GACCAAAATC	CCTTAACGTG	AGTTTTCGTT	CCACTGAGCG	TCAGACCCCG	TAGAAAAGAT	CAAAGGATCT
	CTGGTTTTAG	GGAATTGCAC	TCAAAAGCAA	GGTGACTCGC	AGTCTGGGGC	ATCTTTTCTA	GTTTCCTAGA
3921	TCTTGAGATC	CTTTTTTCT	GCGCGTAATC	TGCTGCTTGC	AAACAAAAA	ACCACCGCTA	CCAGCGGTGG
	AGAACTCTAG	GAAAAAAGA	CGCGCATTAG	ACGACGAACG	TTTGTTTTT	TGGTGGCGAT	GGTCGCCACC
3991	TTTGTTTGCC AAACAAACGG	GGATCAAGAG CCTAGTTCTC	CTACCAACTC GATGGTTGAG	TTTTTCCGAA AAAAAGGCTT	GGTAACTGGC CCATTGACCG	<b>TTCAGCAGAG AAGTCGTCTC</b>	CGCAGATACC GCGTCTATGG
4061	AAATACTGTC TTTATGACAG	CTTCTAGTGT GAAGATCACA	AGCCGTAGTT TCGGCATCAA	AGGCCACCAC TCCGGTGGTG	<b>TTCAAGAACT</b> <b>AAGTTCTTGA</b>	CTGTAGCACC	GCCTACATAC
4131	CTCGCTCTGC	TAATCCTGTT ATTAGGACAA	ACCAGTGGCT TGGTCACCGA	GCTGCCAGTG	GCGATAAGTC CGCTATTCAG	GTGTCTTACC CACAGAATGG	GGGTTGGACT CCCAACCTGA
4201	CAAGACGATA	GTTACCGGAT	AAGGCGCAGC	GGTCGGGCTG	AACGGGGGGT	TCGTGCACAC	AGCCCAGCTT
	GTTCTGCTAT	CAATGGCCTA	TTCCGCGTCG	CCAGCCCGAC	TTGCCCCCCA	AGCACGTGTG	TCGGGTCGAA

### FIG.\_46G

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Threeted 1 Figure 1 Figure 1 Figure 1 Figure 2 Figure

### 131 / 154

4271	GGAGCGAACG ACCTACACCG CCTCGCTTGC TGGATGTGGC	ACCTACACCG TGGATGTGGC	AACTGAGATA TTGACTCTAT	CCTACAGCGT GGATGTCGCA	GAGCTATGAG CTCGATACTC	AAAGCGCCAC TTTCGCGGTG	GCTTCCCGAA CGAAGGGCTT
4341	GGGAGAAAGG CCCTCTTTCC	CGGACAGGTA GCCTGTCCAT	TCCGGTAAGC AGGCCATTCG	GGCAGGGTCG CCGTCCCAGC	GAACAGGAGA CTTGTCCTCT	GCGCACGAGG CGCGTGCTCC	GAGCTTCCAG CTCGAAGGTC
4411	GGGGAAACGC CCCCTTTGCG	CTGGTATCTT GACCATAGAA	TATAGTCCTG ATATCAGGAC	TCGGGTTTCG AGCCCAAAGC	CCACCTCTGA	CTTGAGCGTC GAACTCGCAG	GATTTTGTG CTAAAACAC
4481	ATGCTCGTCA TACGAGCAGT	GGGGGGCGGA	GCCTATGGAA CGGATACCTT	AAACGCCAGC TTTGCGGTCG	AACGCGGCCT TTGCGCCGGA	TTTTACGGTT AAAATGCCAA	CCTGGCCTTT GGACCGGAAA
4551	TGCTGGCCTT ACGACCGGAA	TTGCTCACAT AACGAGTGTA	GTTCTTTCCT CAAGAAAGGA	GCGTTATCCC CGCAATAGGG	CTGATTCTGT GACTAAGACA	GGATAACCGT CCTATTGGCA	ATTACCGCCT TAATGGCGGA
4621	TTGAGTGAGC AACTCACTCG	TGATACCGCT ACTATGGCGA	CGCCGCAGCC	GAACGACCGA	GCGCAGCGAG CGCGTCGCTC	TCAGTGAGCG AGTCACTCGC	AGGAAGCGGA TCCTTCGCCT
4691	AGAGCGCCCA TCTCGCGGGT	ATACGCAAAC TATGCGTTTG	CGCCTCTCCC GCGGAGAGGG	CGCGCGTTGG	CCGATTCATT GGCTAAGTAA	AATGCAGCTG TTACGTCGAC	GCACGACAGG
4761	TTTCCCGACT AAAGGGCTGA	GGAAAGCGGG CCTTTCGCCC	CAGTGAGCGC GTCACTCGCG	AACGCAATTA TTGCGTTAAT	ATGTGAGTTA TACACTCAAT	GCTCACTCAT CGAGTGAGTA	TAGGCACCCC ATCCGTGGGG
4831	AGGCTTTACA TCCGAAATGT	CTTTATGCTT GAAATACGAA	CCGGCTCGTA	TGTTGTGTGG ACAACACACC	AATTGTGAGC TTAACACTCG	GGATAACAAT CCTATTGTTA	TTCACACAGG AAGTGTGTCC
			BSSHII	H			Ecori
4901	AAACAGCTAT TTTGTCGATA	GACCATGATT CTGGTACTAA	ACGCCAAGCG CGCAATTAAC TGCGGTTCGC GCGTTAATTG	CGCAATTAAC GCGTTAATTG	CCTCACTAAA GGAGTGATTT	GGGAACAAAA CCCTTGTTTT	GCTGG CGACC

# FIG.\_46H

### 132 / 154

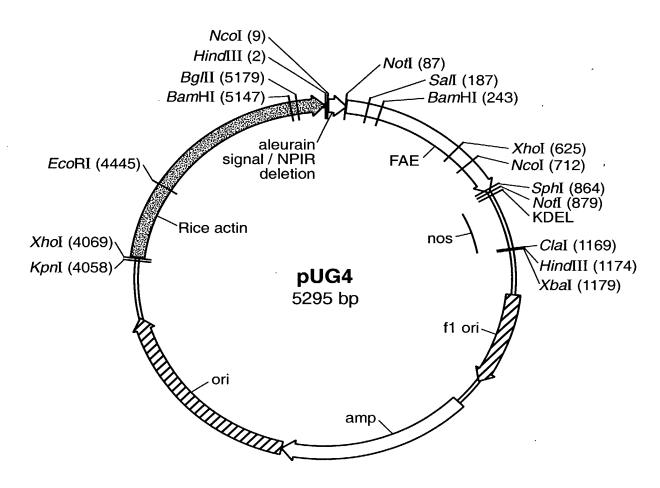


FIG.\_47A

133 / 154

TAGTCGAAAT TACAGCCGTT GGCCACGGCC ល 4 CGAAGACCTC CICCIGGCGC ICGCCGIGCI А ď 闰 ß GCCTCCACGC AGGGCATCTC 4 н Н Ö O CCGCGTCCTC Н > ß æ TGGCCCACGC NotI ರವಿಶಿಲ್ಲಿಲ್ಲ Ħ ď · A S S TCGCCTCCTC AAGCTTACCA

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CTATTATCAA ATTCCGTCGA CCTGTGCAAC U А ď ល GGCCACTATC 141

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GACAACATCC GCCTGTACAC 跘 TATATTGGAT GGGTCTCCGT GACCGTGACC 3 CAGTATCCGG ACTACGCGCT TGCGACATAC GCGACGACAG А TACAACTCGA CGGTGGATAT CCTGGCGGCA CTCACTGCCG CCCAGCTGTC TGGATCCTCC O GTGAAGTACA GCAGGTTAGC ß TGCAACGGTT TTGTCAAACA CCTACCACAA GTCGAGTCGC 211 281 351 491 421

Д Ξ CTTCGCGTCG 4 GCAATCAGGC O Z ט ß CTTCGGCGAA 回 ט 631 561

> TTAACGCGAA ACCCCTATTT TGCTTCAATA TGCGGCATTT

> > TGTGCGCGGA

CCCTGATAAA

ATCCGCTCAT

CTGGTGAAAG GCGGTAAGAT ATGTGGCGCG AATGACTTGG GCAGTGCTGC

CCCAGAAACG

AAGTTCTGCT CTATTCTCAG

AGCACTTTTA

GCCGCATACA

GGTGGCACTT

TTACAATTTA TCAAATATGT TGAGTATTCA

TTCCCTTTTT

TAACAAAAT

CTCGGTCTAT

TCAACCCTAT TGAGCTGATT TTCGGGGAAA GAGACAATAA GACGCCCTTA TAAAAGATGC CCTTGAGAGT

GGAACAACAC GGTTAAAAAA

GTTCCAAACT

GTGGACTCTT TTTGCCGATT ATATTAACGC CTAAATACAT AGGAAGAGTA TTTTTGCTCA

ITCTTTAATA IATAAGGAT ITTTAACAAA GTTTATTTT ATATTGAAA IGCCTTCCTG GAGTGGGTTA

> 1821 1891 1961 2031 2101 2171 2241 2341 2381

1611 1681 1751

1191

1331 1401 1471 1541

1261

TCTTTTGATT

CGGGCAAGAG

TTTCGCCCCG

GTATTGACGC

TTGAGTACTC CATAACCATG GCTTTTTTGC

ACCAGTCACA

GAAAAGCATC CTGCGGCCAA

TTGGGTGCAC AAGAACGTTT GGATCATGTA ACCACGATGC CCCGGCAACA

CGAACTACTT

TTGCGCAAAC TATTAACTGG

ACCGGAGCTG AATGAAGCCA

ATCGTTGGGA GGCAACAACG

ACTCGCCTTG

CTGTAGCAAT

ACAACGATCG

GAGGACCGAA

AGAGAATTAT

CATGACAGTA

TTACGGATGG CTTACTTCTG

CAACTCGGTC

TACCAAACGA

ACAACATGGG

134 / 154

CTTGCGATGA CGTTATTAT GAGCTGTAAA AACTTGATTA GGAGTCCACG AATATAGCGC TACTAGATCG ATAAGCTTCT AGAGCGGCCG ACAACGTCGT GGGACGCGCC TGCCAGCGCC CGTCAAGCTC SAGATGGGTT TTTATGATTA GAGTCCCGCA ATTATACATT TAATACGCGA TAGAAAACAA CCCTTTCGCC GACCCCAAAA CCGGTCGCGG CCGCGGAACC ACTGAAGGAT TAATGCATGA CCGTCGTTTT AATGGCGAAT CCGCTACACT TGTTGCCGGT CGGCTTTCCC CTTTGACGTT L R D HindIII **山** TIGGCAATAA AGTITCTITAA GATIGAAICC AGCATGTAAT AATTAACATG GCGCAGCCTG CGCTCACTGG CAGCACATCC CGCAGCGTGA CCACGTTCGC ACGCCACCTC GTTTTTGCC A A A TTAGTGCTTT CTGATAGACG AATCGCCTTG CCCAACAGTT TCCTTTCTCG GCGCGCGGTG TCATCTATGT GTATTACGCG GGTGGTTACG > Ą٠ rtreggarga cgagcegec arecaceree TTATCATATA ATTTCTGTTG AATTACGTTA GATCGCCCTT GGGTTCCGAT TACCCAACTT CGGCGGGTGT TTTCTTCCT GGCCATCGCC ATAGTGAGTC C T G A GTTCAAACAT ACCCTGGCGT GCTCCCTTTA TCACGTAGTG ATAAATTATC AATTCGCCCT GGCCCGCACC GCATTAAGCG CTCCTTTCGC Ŋ GAAGCAGATC GCAAACTAGG GIGGAGCICC GACTGGGAAA ATAGCGAAGA CTGTAGCGGC CTAGCGCCCG **FAAATCGGGG** GGGTGATGGT Z Ö

CATTTGTCTG

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> ڻ CACTGGGGAT GAAGTGCAGT GCTGTGAGGC CCAGGGCGGA CAGGGTGTGA ATAATGCGCA CACGACTTAT

AGGGGTACGC CCATGGCGGT GTAGAGTACT GGAGCGTTGA TCCTTACAGC GCCCAGAACA

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# FIG.\_47C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Wallsby Targeted The Phenolic Acid Content and Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 135 of 154

135 / 154

	ATTAATAGAC T	TGGATGGAGG	CGGATAAAGT	TGCAGGACCA	CTTCTGCGCT	CGGCCCTTCC	GGCTGGCTGG
	Ħ	ATAAATCTGG	AGCCGGTGAG	CGTGGGTCTC	GCGGTATCAT	TGCAGCACTG	GGGCCAGATG
_	ဗ္ဗ	CCGTATCGTA	GTTATCTACA	CGACGGGGAG	TCAGGCAACT	ATGGATGAAC	GAAATAGACA
	Ě	ATAGGTGCCT	CACTGATTAA	GCATTGGTAA	CTGTCAGACC	AAGTTTACTC	ATATATACTT
TAGATTGATT TAA	A A	FAAACTTCA FTAACGTGAG	TTTTTAATTT	AAAAGGATCT	AGGTGAAGAT AGACCCCGTA	GAAAAGATCA	AATCTCATGA AAGGATCTTC
-	LT	PTTTTTGC	GCGTAATCTG	CTGCTTGCAA	ACAAAAAAC	CACCGCTACC	AGCGGTGGTT
	TCA	ATCAAGAGCT	ACCAACTCTT	TTTCCGAAGG	TAACTGGCTT	CAGCAGAGCG	CAGATACCAA
ATACTGTCCT TCTA	CIA	<b><i>TCTAGTGTAG</i></b>	CCGTAGTTAG	GCCACCACTT	CAAGAACTCT	GTAGCACCGC	CTACATACCT
CGCTCTGCTA ATCC	J.C.	ATCCTGTTAC	CAGTGGCTGC	TGCCAGTGGC	GATAAGTCGT	GTCTTACCGG	GTTGGACTCA
AGACGATAGT TACC	ACC	TACCGGATAA	GGCGCAGCGG	TCGGGCTGAA	CGGGGGGTTC	GTGCACACAG	CCCAGCTTGG
AGCGAACGAC CTAC	TAC	CTACACCGAA	CTGAGATACC	TACAGCGTGA	GCTATGAGAA	AGCGCCACGC	TTCCCGAAGG
GAGAAAGGCG GACA	ACA(	SACAGGTATC	CGGTAAGCGG	CAGGGTCGGA	ACAGGAGAGC	GCACGAGGGA	GCTTCCAGGG
GGAAACGCCT GGTA	GTA	<b>3GTATCTTTA</b>	TAGTCCTGTC	GGGTTTCGCC	ACCTCTGACT	TGAGCGTCGA	TTTTTGTGAT
GCTCGTCAGG GGGG	9999	GGGCGGAGC	CTATGGAAAA	ACGCCAGCAA	CGCGGCCTTT	TTACGGTTCC	TGGCCTTTTG
_	CIC	SCTCACATGT	TCTTTCCTGC	GTTATCCCCT	GATTCTGTGG	ATAACCGTAT	TACCGCCTTT
GAGTGAGCTG ATACC	TACC	ATACCGCTCG	CCGCAGCCGA	ACGACCGAGC	GCAGCGAGTC	AGTGAGCGAG	GAAGCGGAAG
AGCGCCCAAT ACGCA	CGCA	ACGCAAACCG	CCTCTCCCCG	CGCGTTGGCC	GATTCATTAA	TGCAGCTGGC	ACGACAGGTT
	AAGC	AAAGCGGGCA	GTGAGCGCAA	CGCAATTAAT	GTGAGTTAGC	TCACTCATTA	GGCACCCCAG
GCTTTACACT TTATGCTTCC	TATG	CTTCC	GGCTCGTATG	TTGTGTGGAA	TTGTGAGCGG	ATAACAATTT	CACACAGGAA
							KpnI
							2
ACAGCTATGA CCATG XhoI	CATG	CCATGATTAC I	GCCAAGCGCG	CAATTAACCC	TCACTAAAGG	GAACAAAAGC	TGGGTACCGG
1 1 1 1 1 1	l						
GCCCCCCTC GAGG1	AGG1	GAGGTCATTC	ATATGCTTGA	GAAGAGAGTC	GGGATAGTCC	AAAATAAAAC	AAAGGTAAGA
TTACCTGGTC AAAAG	AAAG	AAAGTGAAA	ACATCAGTTA	AAAGGTGGTA	TAAGTAAAAT	ATCGGTAATA	AAAGGTGGCC
Ξ.	TTAC	TTTACTCTTT	TCTACTATTA	TAAAAATTGA	GGATGTTTTG	TCGGTACTT	GATACGTCAT
•	TTGG	ATTGGTTTTT	AAGTTTATTC	GCGATTTGGA	AATGCATATC	TGTATTTGAG	TCGGTTTTTA
AGTICGIIGC TITIGIAAAI	TTTG	<b>TAAAT</b>	ACAGAGGGAT	TTGTATAAGA	AATATCTTTA	AAAAACCCAT	ATGCTAATTT
				ECORI			
				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
GACATAATTT TTGA(	TGA(	<b>TTGAGAAAAA</b>	TATATATTCA	GGCGAATTCC	ACAATGAACA	ATAATAAGAT	TAAAATAGCT
_	CAG	GCAGCGATGG	GTATTTTTC	TAGTAAAATA	AAAGATAAAC	TTAGACTCAA	AACATTTACA
_	TAAZ	CTAAAGTCCT	AAAGCCCAAA	GTGCTATGCA	CGATCCATAG	CAAGCCCAGC	CCAACCCAAC
CCAACCCAAC CCAC	CAC	CCACCCCAGT	GCAGCCAACT	GGCAAATAGT	CTCCACCCC	GGCACTATCA	CCGTGAGTTG

# FIG.\_47D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209, Dunn-Coleman et al.

Docket No. GC648-2

Sheet 136 of 154

136 / 154

TTTTTTTT	GACAAATGCA GCCTCGTGCG GAGCTTTTT GTAGC	TCAGCALIGI	CATGATTET GACAAATGCA GCCTCGTGCG GAGCTTTTTT GTAGC	GCCTCGTGCG	GACAAATGCA	CATGATTTGT	5251
						BGLII	
CGGATGTAGA	GGCGTCTCCG GGCGTGAGTC GGCCCGGATC CTCGCGGGGA ATGGGGCTCT CGGATGTAGA	CTCGCGGGGA	GGCCCGGATC	GGCGTGAGTC	GGCGTCTCCG	TCTCGCGGCT	5111
Bglii			BamHI				
AGGGCGGGA	GGTAGTTTGG GTGGGCGAGA GCGGCTTCGT CGCCCAGATC GGTGCGCGGG AGGGGCGGGA	CGCCCAGATC	GCGGCTTCGT	GTGGGCGAGA	GGTAGTTTGG	CTTTGGCCTT	5041
CGGTCTCGAT	GTAACCACCC CGCCCCTCTC CTCTTTTTT TTTTTCGTCT CGGTCTCGAT	CTCCGTTTTT	CTCTTTCTTT	CGCCCCTCTC	GTAACCACCC	ອລລອລລອລລອ	4971
CICCCCTCC	TACCACCACC ACCACCACCA CCTCCTCCC CCTCGCTGCC GGACGACGAG CTCCTCCCC CTCCCCCTCC	GGACGACGAG	CCTCGCTGCC	CCTCCTCCC	ACCACCACCA	TACCACCACC	4901
CCCCCAACCC	CGCTTCCAAA GAAACGCCCC CCATCGCCAC TATATACATA CCCCCCCTC TCCTCCCATC CCCCCAACCC	CCCCCCCTC	TATATACATA	CCATCGCCAC	GAAACGCCCC	CGCTTCCAAA	4831
GCCCTCCCTC	GTGGGTCCGG GTCGTGGGGG CCGGAAAAGC GAGGAGGATC GCGAGCAGCG ACGAGGCCCG GCCCTCCCTC	GCGAGCAGCG	GAGGAGGATC	CCGGAAAAGC	GTCGTGGGGG	GTGGGTCCGG	4761
AAAACAGCAG	TCCGCACCAC CGCACGTCTC GCAGCCAAAA AAAAAAAA AAAGAAAAA AAGAAAAAGA AAAACAGCAG	AAAGAAAAA	AAAAAAAG	GCAGCCAAAA	CGCACGTCTC	TCCGCACCAC	469T

### FIG.\_47E

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Fargeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 137 of 154

### 137 / 154

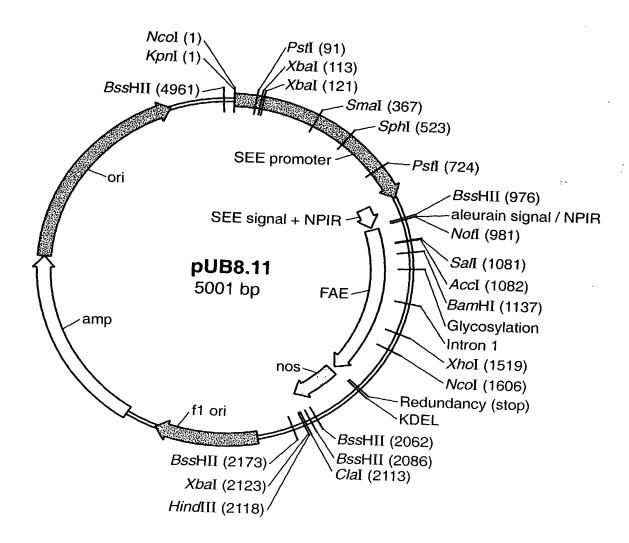


FIG.\_48A

138 / 154

ᆏ	CATGGGCCAG GTACCCGGTC		GTATAATTAT GGGATATCTC AAGCAAATAA TCGAAATATC ACCATTGGCT ACAATATCTG CATATTAATA CCCTATAGAG TTCGTTTATT AGCTTTATAG TGGTAACCGA TGTTATAGAC	AAGCAAATAA TTCGTTTATT	TCGAAATATC AGCTTTATAG	ACCATTGGCT TGGTAACCGA	ACAATATCTG TGTTATAGAC	
		PstI	į		XbaI	XbaI		
71	AGCTCCGAGT TCGAGGCTCA		TCTGACTGCA GTCTGGATGA AGACTGACGT CAGACCTACT	CGCGTGTTGT GCGCACAACA	ATCTAGAACT CTAGATAGCA TAGATCTTGA GATCTATCGT		CAGCCACAGC GTCGGTGTCG	
141	ACCTACAGGA TGGATGTCCT	ACCTACAGGA GTGCGACACT TGGATGTCCT CACGCTGTGA	TGTGGACTGT ACACCTGACA	TGTGGACTGT AGTAGTGTTG ACACCTGACA TCATCACAAC	GAGACGGAGC TCTTTCCTAC CTCTGCCTCG AGAAAGGATG	TCTTTCCTAC AGAAAGGATG	CTCCTGACGT GAGGACTGCA	
211	TGCCGCCGTT ACGGCGGCAA	GTCCATTCCA CAGGTAAGGT	ACGGCATCAC TGCCGTAGTG	TCTCAACCAA AGAGTTGGTT	TCACGCGCTC AGTGCGCGAG	CCAACAAAAT GGTTGTTTTA	ATCGTCCCCC TAGCAGGGGG	
281	ATGTCTTGGC TACAGAACCG	GGAGAGAGAG CCTCTCTCTC	TACATACATG ATGTATGTAC	CTGTCGCGCC	CTGTCGCGC GTTTTTGTCT GACAGCGCG CAAAAACAGA	GAATCTCGCT CTTAGAGCGA	TCCACTGGCC AGGTGACCGG	
351	AATCAGCTCA TTAGTCGAGT	SmaI  AATCAGCTCA GCTCCCGGGA TTAGTCGAGT CGAGGGCCCT		TCAAGATCCC AGTTCTAGGG	ATCGTCGTCG TAGCAGCAGC	TCACCCCTGG AGTGGGGACC	CGTCATGGGA GCAGTACCCT	
421	TGGAAAAGAA ACCTTTTCTT	TGGAAAAGAA CCTCCGTTGC ACCTTTTCTT GGAGGCAACG	TCGGATGAGT AGCCTACTCA	TCGGATGAGT CAGCCATATC AGCCTACTCA GTCGGTATAG	CCCGAACAGA GGGCTTGTCT	GTACTGCAAG	ATAACCCAAT TATTGGGTTA	
			Sphi	Ħ				

Ncol ~~~~~ KpnI

# FIG.\_48B

TCAGATICCC CCAAIAGAGA AAGIAIAGCA IGCIIITCGGG IITIGIIIIGG CIIAAIIGAC IITAIIIIIIG

AGTCTAAGGG GGTTATCTCT TTCATATCGT ACGAAAGCCC AAAACAAACC

491

TTGGAGTTGA ATGCTGATTT GTTGTGTAAA ATGCCCAACC ATCTGAATAT CGAGACGGAT AATAGGCTGG

CAACACATTT TACGGGTTGG TAGACTTATA

AACCTCAACT TACGACTAAA

561

GAATTAACTG AAATAAAAAC

GCTCTGCCTA TTATCCGACC

### 139 / 154

GCTGGAGGCT CGACCTCCGA		GGTATAAAAC CCATATTTTG	GGACGACCCA CCTGCTGGGT	CTCGCCGTCT GAGCGGCAGA	BssHII	Noti	CCGAGCGCGC		TATCTCCCAA ATAGAGGGTT			AATTCTCAAA TTAAGAGTTT
GGGCATTACA CCCGTAATGT		CGATGAGATG GCTACTCTAC	TCCCCCTGCC	CTTCTTGGCG GAAGAACCGC			CGGCCCGTCA GCCGGGCAGT		AAATGGCCAC TTTACCGGTG			GAAAATTTAC CTTTTAAATG
ATATCTTTCT TATAGAAAGA		TGAAGCGTGG ACTTCGCACC	CTCGCCTCGC GAGCGGAGCG	GCCGCATCCT CGGCGTAGGA			CAACCCGATC GTTGGGCTAG		CGTTTAGTCG GCAAATCAGC			TCAAGGGAGA AGTTCCCTCT
CACATCGCAA GTGTAGCGTT		AAGCAAGTGG TTCGTTCACC	CCAGTACCAT GGTCATGGTA	ATGGCCCACG TACCGGGTGC			TGGCGGACTC ACCGCCTGAG		TCTCCGAAGA CCTCTACAGC AGAGGCTTCT GGAGATGTCG	SalI	Acci	
TTCTGTAGTG AAGACATCAC	PstI	GAAACACTCT GCAGAGCCTG CTTTGTGAGA CGTCTCGGAC	CTCCCGCCTA	CGCCGGCGAG GCGGCCGCTC			GCCGCATCNT CGGCGTAGNA		TCTCCGAAGA AGAGGCTTCT		ì	CAACATTCCG TCGACTATTA GTTGTAAGGC AGCTGATAAT
TATAGCAAGA ATATCGTTCT	Å	GAAACACTCT CTTTGTGAGA	GGGACGCGAG CCCTGCGCTC	GTTGCCCACT CAACGGGTGA			CGCGGTGGCC					CCGACCTGTG GGCTGGACAC
CTAATTAATT GATTAATTAA		TCATCAGCCT AGTAGTCGGA	CCCCGGCACC	GTAAAATACT CATTTTATGA			TGGCCACCGC ACCGGTGGCG	Noti	GGCCGCCTCC ACGCAGGGCA			GCTGCCTACG CCGACCTGTG CGACGGATGC GGCTGGACAC
631		701	771	841			911		981			1051

### 140 / 154

GTGGCACTGG CACCGTGACC	ACAATGCAAC TGTTACGTTG	TCGCTTGTCA	CCTCCCTGGC	CGAACCGCGC GCTTGGCGCG	ACGACGCAGT TGCTGCGTCA	Ncol ACGCCCATGG TGCGGGTACC	GGATGAAGTG CCTACTTCAC	ATGACGAGCG TACTGCTCGC	TCCTGGAGAG
ACCGTCTTCC TGGCAGAAGG	ACACCCTACC TGTGGGATGG	CCAAGTCGAG GGTTCAGCTC	KCCCTCGGCG	ACACCTTCGG TGTGGAAGCC	XhoI crc GaGCCCAGAT GAG CTCGGGTCTA	GAGCAGGGGT CTCGTCCCCA	TCTGCACTGG	TTATTTTGGG AATAAAACCC	AAGATGGATG TTCTACCTAC
AGAAATAATC TCTTTATTAG	ACGCCTTTCG TGCGGAAAGC	CCGTCCAGGA GGCAGGTCCT	GACCGGCCAC	ATCCGCCTGT TAGGCGGACA	TCCAAGC	GCCCCGGTG CGGGGGCCAC	AACACATTTG TTGTGTAAAC	CGCACACGAC GCGTGTGCTG	TGTACCAGGA ACATGGTCCT
ACAGCAGCAA TGTCGTCGTT	CTACACCCTC GATGTGGGAG	GGATGGGTCT CCTACCCAGA	CGCTGACCGT GCGACTGGCA	ATACGACAAC TATGCTGTTG	AACGATGCCT TTGCTACGGA	TCCCAAACCT AGGGTTTGGA	CAGCGCCCAG GTCGCGGGTC	GTGAATAATG CACTTATTAC	CCTCCCGAG
CTCCGCGACG	TCGATACTAA AGCTATGATT	ATATTATAT TATAATATAA	CCGGACTACG GGCCTGATGC	TGTCTGCGAC	GTCGTACATG	AACGACGGCA TTGCTGCCGT	TTGATCCTTA AACTAGGAAT	CGGACAGGGT GCCTGTCCCA	GTCATTTCAG CAGTAAAGTC
CGGATGGATC	AATCTACAAC TTAGATGTTG	TACACGGTGG ATGTGCCACC	TAGCCAGTAT ATCGGTCATA	GCCGCCCAGC	AGGCCTTCGC TCCGGAAGCG	CACTCATGCC GTGAGTACGG	TACTGGAGCG	CAGTGCTGTG AGGCCCAGGG GTCACGACAC TCCGGGTCCC	ATGGTGATCA TACCACTAGT
CTGACATTAA GACTGTAATT	TAGTGATACG ATCACTATGC	GGTTGTGAAG CCAACACTTC	AACAGCAGGT TTGTCGTCCA	GGCACTCACT CCGTGAGTGA	AGCGGCAATC TCGCCGTTAG	ATTTCCGGGT TAAAGGCCCA	CGGTGTAGAG GCCACATCTC	CAGTGCTGTG GTCACGACAC	GAGCCTGTAC CTCGGACATG
1121	1191	1261	1331	1401	1471	1541	1611	1681	1751

BamHI

### FIG.\_48D

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted." In the Content and Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 141 of 154

### 141 / 154

TTTC	CATG	TATA ATAT	ATCT TAGA	АТТА ТАВТ	200 E	AGCG CAAC GTTG	TGGT	CTTT
ATAAAGTTTC TATTTCAAAG	GTTAAGCATG CAATTCGTAC	CGCAATTATA GCGTTAATAT	GGTGTCATCT CCACAGTAGA	AGTCGTATTA TCAGCATAAT		TGAATTAGUG CCTTCCCAAC GGAAGGGTTG	GTGTGGTGGT CACACCACCA	CCCTTCCTTT GGGAAGGAAA
ACATTTGGCA TGTAAACCGT	GTTGAATTAC CAACTTAATG	ATTAGAGTCC TAATCTCAGG	BSSHII ~~~~~ TATCGCGCGC ATAGCGCGCG	CCCTATAGTG	GCGTTACCCA	CGCAATGGGT CACCGATCGC GTGGCTAGCG	AGCGCGGCGG TCGCGCCGCC	TCGCTTTCTT AGCGAAAGAA
GATCGTTCAA	TATAATTTCT ATATTAAAGA	GGTTTTTATG CCAAAAATAC	TAGGATAAAT ATCCTATTTA	CTCCAATTCG	GAAAACCCTG	CTTTTGGGAC AAGAGGCCCG TTCTCCGGGC	CGGCGCATTA GCCGCGTAAT	CCCGCTCCTT GGGCGAGGAA
TAAAGAAGCA ATTTCTTCGT	ATGATTATCA TACTAATAGT	TTATGAGATG AATACTCTAC	BSSHII ~~~~~ GCGCGCAAAC CGCGCGTTTG	GCCGGTGGAG	TCGTGACTGG	AGCACTGACC CGTAATAGCG GCATTATCGC	CGCCCTGTAG GCGGGACATC	CGCCCTAGCG GCGGGATCGC
GGATGAGCTG CCTACTCGAC	CGGTCTTGCG GCCAGAACGC	ATGACGTTAT TACTGCAATA	АСААААТАТА ТGTTTTATAT	XbaI ~~~~~ CTAGAGCG	TTTACAACG	AAATGTTGC CGCCAGCTGG GCGGTCGACC	GAATGGGACG CTTACCCTGC	CACTTGCCAG GTGAACGGTC
AACCACTGAA TTGGTGACTT	ATCCTGTTGC TAGGACAACG	CATGTAATGC GTACATTACG	GCGATAGAAA CGCTATCTTT	Clal HindIII	CTGGCGTCG	GACCGGCAGC ATCCCCCTTT TAGGGGGAAA	CCTGAATGGC GGACTTACCG	GTGACCGCTA CACTGGCGAT
GGGGCCGCGT	TTAAGATTGA AATTCTAACT	TAATAATTAA ATTATTAATT	CATTTAATAC GTAAATTATG	ATGTTACTAG TACAATGATC	BSSHII	GCGCGCGGGT CTTGCAGCAC GAACGTCGTG	AGTTGCGCAG TCAACGCGTC	TACGCGCAGC ATGCGCGTCG
1821	1891	1961	2031	2101	2171	2241	2311	2381

### FIG.\_48E

142 / 154

2451	CTCGCCACGT GAGCGGTGCA	TCGCCGGCTT AGCGGCCGAA	TCCCCGTCAA AGGGGCAGTT	GCTCTAAATC CGAGATTTAG	GGGGGCTCCC	TTTAGGGTTC AAATCCCAAG	<b>CGATTTAGTG</b> GCTAAATCAC
2521	CTTTACGGCA	CCTCGACCCC	AAAAAACTTG	ATTAGGGTGA	TGGTTCACGT	AGTGGGCCAT	CGCCCTGATA
	GAAATGCCGT	GGAGCTGGGG	TTTTTTGAAC	TAATCCCACT	ACCAAGTGCA	TCACCCGGTA	GCGGGACTAT
2591	GACGGTTTTT	CGCCCTTTGA	CGTTGGAGTC	CACGTTCTTT	AATAGTGGAC	TCTTGTTCCA	AACTGGAACA
	CTGCCAAAAA	GCGGGAAACT	GCAACCTCAG	GTGCAAGAAA	TTATCACCTG	AGAACAAGGT	TTGACCTTGT
2661	ACACTCAACC	CTATCTCGGT	CTATTCTTTT	GATTTATAAG	GGATTTTGCC	GATTTCGGCC	TATTGGTTAA
	TGTGAGTTGG	GATAGAGCCA	GATAAGAAAA	CTAAATATTC	CCTAAAACGG	CTAAAGCCGG	ATAACCAATT
2731	AAAATGAGCT	GATTTAACAA	AAATTTAACG	CGAATTTTAA	CAAAATATTA	ACGCTTACAA	TTTAGGTGGC
	TTTTACTCGA	CTAAATTGTT	TTTAAATTGC	GCTTAAAATT	GTTTTATAAT	TGCGAATGTT	AAATCCACCG
2801	ACTTTTCGGG	GAAATGTGCG	CGGAACCCCT	ATTTGTTTAT	TTTTCTAAAT	ACATTCAAAT	ATGTATCCGC
	TGAAAAGCCC	CTTTACACGC	GCCTTGGGGA	TAAACAAATA	AAAAGATTTA	TGTAAGTTTA	TACATAGGCG
2871	TCATGAGACA	ATAACCCTGA	TAAATGCTTC	AATAATATTG	aaaaaggaag	AGTATGAGTA	TTCAACATTT
	AGTACTCTGT	TATTGGGACT	ATTTACGAAG	TTATTATAAC	ttttccttc	TCATACTCAT	AAGTTGTAAA
2941	CCGTGTCGCC	CTTATTCCCT GAATAAGGGA	TTTTTGCGGC AAAAACGCCG	ATTTTGCCTT TAAAACGGAA	CCTGTTTTTG GGACAAAAAC	CTCACCCAGA GAGTGGGTCT	AACGCTGGTG TTGCGACCAC
3011	AAAGTAAAAG TTTCATTTTC	ATGCTGAAGA TACGACTTCT	TCAGTTGGGT AGTCAACCCA	GCACGAGTGG	GTTACATCGA CAATGTAGCT	ACTGGATCTC TGACCTAGAG	AACAGCGGTA TTGTCGCCAT
3081	AGATCCTTGA	GAGTTTTCGC	CCCGAAGAAC	GTTTTCCAAT	GATGAGCACT	TTTAAAGTTC	TGCTATGTGG
	TCTAGGAACT	CTCAAAAGCG	GGGCTTCTTG	CAAAAGGTTA	CTACTCGTGA	AAATTTCAAG	ACGATACACC
3151	CGCGGTATTA GCGCCATAAT	TCCCGTATTG AGGGCATAAC	ACGCCGGGCA	AGAGCAACTC TCTCGTTGAG	GGTCGCCGCA CCAGCGGCGT	TACACTATTC ATGTGATAAG	TCAGAATGAC AGTCTTACTG
3221	TTGGTTGAGT	ACTCACCAGT	CACAGAAAAG	CATCTTACGG	ATGGCATGAC	AGTAAGAGAA	TTATGCAGTG
	AACCAACTCA	TGAGTGGTCA	GTGTCTTTTC	GTAGAATGCC	TACCGTACTG	TCATTCTCTT	AATACGTCAC

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 143 of 154

143 / 154

3291	CTGCCATAAC	CATGAGTGAT	AACACTGCGG	CCAACTTACT	TCTGACAACG	ATCGGAGGAC	CGAAGGAGCT
	GACGGTATTG	GTACTCACTA	TTGTGACGCC	GGTTGAATGA	AGACTGTTGC	TAGCCTCCTG	GCTTCCTCGA
3361	AACCGCTTTT TTGGCGAAAA	TTGCACAACA AACGTGTTGT	TGGGGGATCA	TGTAACTCGC ACATTGAGCG	CTTGATCGTT GAACTAGCAA	GGGAACCGGA CCCTTGGCCT	GCTGAATGAA CGACTTACTT
3431	GCCATACCAA	ACGACGAGCG	TGACACCACG	ATGCCTGTAG	CAATGGCAAC	AACGTTGCGC	AAACTATTAA
	CGGTATGGTT	TGCTGCTCGC	ACTGTGGTGC	TACGGACATC	GTTACCGTTG	TTGCAACGCG	TTTGATAATT
3501	CTGGCGAACT	ACTTACTCTA	GCTTCCCGGC	AACAATTAAT	AGACTGGATG	GAGGCGGATA	AAGTTGCAGG
	GACCGCTTGA	TGAATGAGAT	CGAAGGGCCG	TTGTTAATTA	TCTGACCTAC	CTCCGCCTAT	TTCAACGTCC
3571	ACCACTTCTG TGGTGAAGAC	CGCTCGGCCC	TTCCGGCTGG AAGGCCGACC	CTGGTTTATT GACCAAATAA	GCTGATAAAT CGACTATTTA	CTGGAGCCGG	TGAGCGTGGG ACTCGCACCC
3641	TCTCGCGGTA	TCATTGCAGC AGTAACGTCG	ACTGGGGCCA TGACCCCGGT	GATGGTAAGC CTACCATTCG	CCTCCCGTAT	CGTAGTTATC GCATCAATAG	TACACGACGG ATGTGCTGCC
3711	GGAGTCAGGC CCTCAGTCCG	AACTATGGAT TTGATACCTA	GAACGAAATA CTTGCTTTAT	GACAGATCGC CTGTCTAGCG	TGAGATAGGT ACTCTATCCA	GCCTCACTGA	TTAAGCATTG AATTCGTAAC
3781	GTAACTGTCA	GACCAAGTTT	ACTCATATAT	ACTTTAGATT	GATTTAAAAC	TTCATTTTTA	atttaaaagg
	CATTGACAGT	CTGGTTCAAA	TGAGTATATA	TGAAATCTAA	CTAAATTTTG	AAGTAAAAAT	taaattttcc
3851	ATCTAGGTGA	AGATCCTTTT	TGATAATCTC	ATGACCAAAA	TCCCTTAACG	TGAGTTTTCG	TTCCACTGAG
	TAGATCCACT	TCTAGGAAAA	ACTATTAGAG	TACTGGTTTT	AGGGAATTGC	ACTCAAAAGC	AAGGTGACTC
3921	CGTCAGACCC GCAGTCTGGG	CGTAGAAAAG GCATCTTTTC	ATCAAAGGAT TAGTTTCCTA	CTTCTTGAGA GAAGAACTCT	TCCTTTTTTT AGGAAAAAA	CTGCGCGTAA	TCTGCTGCTT AGACGACGAA
3991	GCAAACAAAA	AAACCACCGC	TACCAGCGGT	GGTTTGTTTG	CCGGATCAAG	AGCTACCAAC	TCTTTTTCCG
	CGTTTGTTTT	TTTGGTGGCG	ATGGTCGCCA	CCAAACAAAC	GGCCTAGTTC	TCGATGGTTG	AGAAAAAGGC
4061	AAGGTAACTG TTCCATTGAC	GCTTCAGCAG CGAAGTCGTC	AGCGCAGATA TCGCGTCTAT	CCAAATACTG GGTTTATGAC	TCCTTCTAGT AGGAAGATCA	GTAGCCGTAG CATCGGCATC	TTAGGCCACC

# FIG.\_48G

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted To The Phenolic Acid Content and Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 144 of 154

### 144 / 154

4131	ACTTCAAGAA TGAAGTTCTT	CTCTGTAGCA GAGACATCGT	CCGCCTACAT	ACCTCGCTCT TGGAGCGAGA	GCTAATCCTG CGATTAGGAC	TTACCAGTGG AATGGTCACC	CTGCTGCCAG
4201	TGGCGATAAG ACCGCTATTC	TCGTGTCTTA AGCACAGAAT	CCGGGTTGGA	CTCAAGACGA GAGTTCTGCT	TAGTTACCGG	ATAAGGCGCA TATTCCGCGT	GCGGTCGGGC CGCCAGCCCG
4271	TGAACGGGGG	GTTCGTGCAC	ACAGCCCAGC TGTCGGGTCG	TTGGAGCGAA AACCTCGCTT	CGACCTACAC GCTGGATGTG	CGAACTGAGA GCTTGACTCT	TACCTACAGC ATGGATGTCG
4341	GTGAGCTATG CACTCGATAC	AGAAAGCGCC TCTTTCGCGG	ACGCTTCCCG TGCGAAGGGC	AAGGGAGAAA TTCCCTCTTT	GGCGGACAGG CCGCCTGTCC	TATCCGGTAA ATAGGCCATT	GCGGCAGGGT CGCCGTCCCA
4411	CGGAACAGGA GCCTTGTCCT	GAGCGCACGA	GGGAGCTTCC CCCTCGAAGG	AGGGGGAAAC TCCCCCTTTG	GCCTGGTATC	TTTATAGTCC AAATATCAGG	TGTCGGGTTT ACAGCCCAAA
4481	CGCCACCTCT GCGGTGGAGA	GACTTGAGCG CTGAACTCGC	TCGATTTTTG AGCTAAAAAC	TGATGCTCGT ACTACGAGCA	CAGGGGGGCG	GAGCCTATGG CTCGGATACC	AAAACGCCA TTTTTGCGGT
4551	GCAACGCGGC	CTTTTTACGG GAAAAATGCC	TTCCTGGCCT AAGGACCGGA	TTTGCTGGCC AAACGACCGG	TTTTGCTCAC AAAACGAGTG	ATGTTCTTTC TACAAGAAAG	CTGCGTTATC GACGCAATAG
4621	CCCTGATTCT GGGACTAAGA	GTGGATAACC CACCTATTGG	GTATTACCGC CATAATGGCG	CTTTGAGTGA GAAACTCACT	GCTGATACCG CGACTATGGC	CTCGCCGCAG	CCGAACGACC GGCTTGCTGG
4691	GAGCGCAGCG CTCGCGTCGC	AGTCAGTGAG TCAGTCACTC	CGAGGAAGCG GCTCCTTCGC	GAAGAGCGCC CTTCTCGCGG	CAATACGCAA GTTATGCGTT	ACCGCCTCTC TGGCGGAGAG	CCCGCGCGTT
4761	GGCCGATTCA CCGGCTAAGT	TTAATGCAGC AATTACGTCG	TGGCACGACA	GGTTTCCCGA CCAAAGGGCT	CTGGAAAGCG	GGCAGTGAGC CCGTCACTCG	GCAACGCAAT CGTTGCGTTA
4831	TAATGTGAGT ATTACACTCA	TAGCTCACTC ATCGAGTGAG	ATTAGGCACC TAATCCGTGG	CCAGGCTTTA GGTCCGAAAT	CACTTTATGC GTGAAATACG	TTCCGGCTCG AAGGCCGAGC	TATGTTGTGT ATACAACACA

### FIG.\_48H

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 145 of 154

145 / 154

BSSHII

GGAATTGTGA GCGGATAACA ATTTCACACA GGAAACAGCT ATGACCATGA TTACGCCAAG CGCGCAATTA CCTTAACACT CGCCTATTGT TAAAGTGTGT CCTTTGTCGA TACTGGTACT AATGCGGTTC GCGCGTTAAT

4901

Ncol

KpnI  ACCCTCACTA AAGGGAACAA AAGCTGGGTA C TGGGAGTGAT TTCCCTTGTT TTCGACCCAT G

4971

### 146 / 154

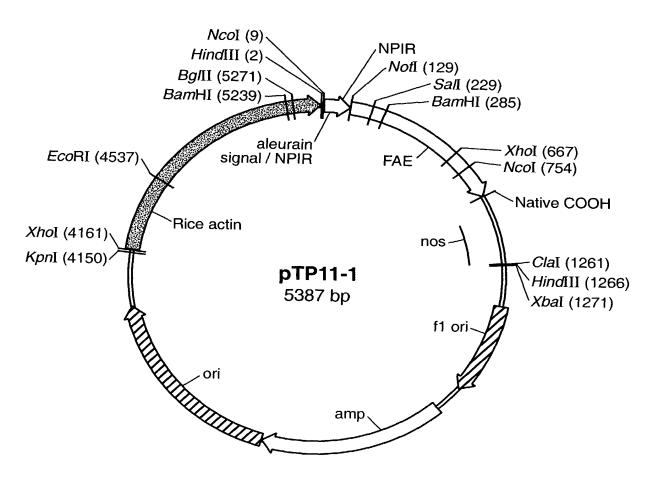


FIG.\_49A

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147 / 154

А > щ ĸ ACCCGATCCG TTTAGTCGAA н щ Z TCCGAAGACC TCTACAGCCG GCCGACTCCA Ŋ Α ď 111111 Acci ល GCAGGCCATC ß 141

GCCGTCGCCG

GGCCACGGCC

CICCIGGCGC ICGCCGIGCT

CCGCGTCCTC

AAGCTTACCA

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O ß AAGGGAGAGA AAATTTACAA Z 闰 Ö ß Z GACCTGTGCA BamHI 211

Α ß Ö Ö GICCAGGACC AAGTCGAGIC 闰 CACGGTGGAT ATTATATTGG ATGGGTCTCC ល CCGCGACGAC А 吆 GATGGATCCT 281 351 421

CCGCCTGTAC ACCTTCGGCG AACCGCGCAG CGGCAATCAG Ö H 561 491

CGATGCCTTC CAAGCCTCGA GCCCAGATAC А Д ល Ø 4 Ω Z Σ Ŋ ď Ŀ

XhoI

# FIG.\_49B

148 / 154

NCOL

IGTAATGCAT GACGTTATTT ATGAGATGGG TTTTTATGAT TAGAGTCCCG CAATTATACA TTTAATACGC GATAGAAAAC AAAATATAGC GCGCAAACTA GGATAAATTA TCGCGCGCGG TGTCATCTAT GTTACTAGAT ATCCTTGAGA GGTTGAGTAC CTCATGCCAA CGACGGCATC CCAAACCTGC CCCCGGTGGA GCAGGGGTAC GCCCATGGCG GTGTAGAGTA CTGGAGCGTT GATCCTTACA GCGCCCAGAA CACATTTGTC TGCACTGGGG ATGAAGTGCA GTGCTGTGAG SCCCAGGGCG GACAGGGTGT GAATAATGCG CACACGACTT ATTTTGGGAT GACGAGCGGA GCCTGTACAT CTGGAGAGGG GGCCGCGTAA AAAGTTTCTT AAGATTGAAT ATAATTAACA TGCAGCACAT CGGTTTTTCG ACTCAACCCT AATGAGCTGA TTTTCGGGGA ATGAGACAAT GTGTCGCCCT AGTAAAAGAT CGGTATTATC GCCATAACCA TTGCGCAGCC CGCGCAGCGT CGCCACGTTC TTACGGCACC CGCGCTCACT > Ö TGAATTACGT TAAGCATGTA ATTTAGTGCT TTGGTTAAAA CGCTGGTGAA CAGCGGTAAG TTAATCGCCT TTCCCAACAG GTGGTGGTTA CTTCCTTTCT CCCTGATAGA CTGGAACAAC TAGGTGGCAC GTATCCGCTC CAACATTTCC CTATGTGGCG AGAATGACTT ATGCAGTGCT TCGTATTACG H SGIGATCAGI CATITICAGIC TCCCCGAGIG TACCAGGAAA GAIGGAIGIC ATTTGGCAAT TAGGGTTCCG CTATAGTGAG GTTACCCAAC CACTATTCTC TCTTACGGAT GGCATGACAG TAAGAGAATT CCGATCGCCC CGCGGCGGGT GCTTTCTTCC TGGGCCATCG TTGTTCCAAA TTTCGGCCTA GCTTACAATT ATTCAAATAT TATGAGTATT CACCCAGAAA TGGATCTCAA TAAAGTTCTG G U Ŀ × TCGTTCAAAC TAATTTCTGT TCGCCGCATA CCAATTCGCC GCGCATTAAG GTTCACGTAG ATTTTGCCGA TTCTAAATAC AAAGGAAGAG TACATCGAAC TGAGCACTTT AAACCCTGGC GAGGCCCGCA CGCTCCTTTC GGGCTCCCTT TAGTGGACTC AAATATTAAC TGTTTTGCT > H щ AAGAAGCAGA GATTATCATA CCCTGTAGCG TCTAAATCGG TAGGGTGATG CGTTCTTTAA TTTATAGGG AATTTTAACA TAATATTGAA TTTGCCTTCC TTTCCAATGA AGCAACTCGG GTGACTGGGA CCCTAGCGCC TTGTTTTTT ACGAGTGGGT CGGTGGAGCT TAATAGCGAA Z щ GTCTTGCGAT CCACTGAAGG ATGAGCTGTA GCCGGGCAAG CGATAAGCTT CTAGAGCGGC CCAGCTGGCG ATGGGACGCG CTTGCCAGCG CCCGTCAAGC AAAACTTGAT TTGGAGTCCA ATTCTTTGA ATTTAACGCG GAACCCCTAT AATGCTTCAA TTTGCGGCAT CGAAGAACGT CAGAAAAGCA TTACAACGTC AGTTGGGTGC Ö HindIII **IGAATGGCGA** ATCTCGGTCT AACCCTGATA LCACCAGTCA CTGTTGCCG GGCCGTCGTT CCCCTTTCG SACCGCTACA GCCGCTTTC TCGACCCCAA CCCTTTGACG TTTAACAAAA AATGTGCGCG PATTCCCTTT GCTGAAGATC GTTTTCGCCC CCGTATTGAC 701 771 841 1191 981 1051 1331 1401 1471 1541 1611 1681 1751 1821 1891 1961 2031 2101 2171 2241 2311 1121

# FIG.\_49C

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209; Dunn-Coleman et al.

Docket No. GC648-2

Sheet 149 of 154

149 / 154

TTTT AAAC TAC GCG TATC	SAGA SAGA SCCG SAGA SAGA	AACT AGTC SGGT FGAG STGA	CTGT CGAG CATT STTA SAGC FAAA	FAGT FAAA STTT CATA FCTT	rgaa ataa ccat
CCGCTTTTTT CATACCAAAC GGCGAACTAC CACTTCTGCG TCGCGGTATC	AGTCAGGCAA AACTGTCAGA CTAGGTGAAG TCAGACCCG AAACAAAAA GGTAACTGGC	TTCAAGAACT GCGATAAGTC AACGGGGGGT GAGCTATGAG GAACAGGAGA CCACCTCTGA	CTGATTCTGT GCGCAGCGAG CCGATTCATT ATGTGAGTTA AATTGTGAGC CCTCACTAAA	TCGGGATAGT TATAAGTAAA GAGGATGTTT GAAATGCATA GAAATATCTT	CCACAATGAA TAAAAGATAA CACGATCCAT
AAGGAGCTAA TGAATGAAGC ACTATTAACT GTTGCAGGAC AGCGTGGGTC	CACGACGGGG AAGCATTGGT TTAAAAGGAT CCACTGAGCG TGCTGCTTGC	AGGCCACCAC GCTGCCAGTG GGTCGGGCTG CCTACAGCGT GGCAGGGTCG TCGGGTTTCG	GCGTTATCCC GAACGACCGA CGCGCGTTGG AACGCAATTA TGTTGTGTGG CGCAATTAAC	GAGAAGAGAG TAAAAGGTGG TATAAAAATT TCGCGATTTG ATTTGTATAA	CAGGCGAATT TCTAGTAAAA AAGTGCTATG
CGGAGGACCG GAACCGGAGC CGTTGCGCAA GGCGGATAAA GGAGCCGGTG	TAGITATCTA CTCACTGATT CATTTTAAT AGTTTTCGTT GCGCGTAATC CTACCAACTC	AGCCGTAGTT ACCAGTGGCT AAGGCGCAGC AACTGAGATA TCCGGTAAGC TATAGTCCTG	GTTCTTTCCT CGCCGCAGCC CGCCTCTCCC CAGTGAGCGC CCGGCTCGTA ACGCCAAGCG	TCATATGCTT AAACATCAGT TTTCTACTAT TTAAGTTTAT ATACAGAGGG	AATATATATT GGGTATTTTT CTAAAGCCCA
TGACGACGAT TGATCGTTGG ATGGCAACAA ACTGGATGGA TGATAAATCT	TCCCGTATCG AGATAGGTGC TTTAAAAACTT CCTTAACGTG CTTTTTTCT GGATCTAAGAG	CTTCTAGTGT TAATCCTGTT GTTACCGGAT ACCTACACCG CGGACAGGTA CTGGTATCTT GGGGGGCGGA	TTGCTCACAT TGATACCGCT ATACGCAAAC GGAAAGCGGG CTTTATGCTT GACCATGATT	TCGAGGTCAT TCAAAAGTGA AATTTACTCT GAATTGGTTT GCTTTTGTAA	TTTTGAGAAA TTGCAGCGAT CCCTAAAGTC
AACTTACTTC TAACTCGCCT GCCTGTAGCA CAATTAATAG GGTTTATTGC	TGGTAAGCCC CAGATCGCTG TTTAGATTGA GACCAAAATC TCTTGAGATC	AAATACTGTC CTCGCTCTGC CAAGACGATA GGAGCGAACG GGGGAAAGG GGGGAAACGC	TGCTGGCCTT TTGAGTGAGC AGAGCGCCCA TTTCCCGACT AGGCTTTACA AAACAGCTAT	GGGCCCCCC GATTACCTGG CCCAAAGTGA ATTTTTGTAT TAAGTTCGTT	TTGACATAAT CTTGCCCCCG CAAAACAAC
CACTGCGGCC GGGGATCATG ACACCACGAT TTCCCGGCAA CCGGCTGGCT	TGGGGCCAGA ACGAAATAGA TCATATATAC ATAATCTCAT CAAAGGATCT CCAGCGGTGG	CGCAGATACC GCCTACATAC GGGTTGGACT AGCCCAGCTT GCTTCCCGAA GAGCTTCCAG	CCTGGCCTTT ATTACCGCCT AGGAAGCGGA GCACGACAGG TAGGCACCCC TTCACACAGG	GCTGGGTACC ACAAAGGTAA TAAAAGGTGG TTGATACGTC	ATATGCTAAT ATTAAAATAG AAAACATTTA
TGAGTGATAA GCACAACATG GACGAGCGTG TTACTCTAGC CTCGGCCCTT	ATTGCAGCAC CTATGGATGA CCAAGTTTAC ATCCTTTTTG TAGAAAGAT	TTCAGCAGAG CTGTAGCACC GTGTCTTACC TCGTGCACAC AAAGCGCCAC GCGCACGAGG	TTTTACGGTT GGATAACCGT TCAGTGAGCG AATGCAGCTG GCTCACTCAT GGATAACAAT	GGGAACAAAA CCAAAATAAA ATATCGGTAA TGTCGGTACT	TAAAAAACCC CAATAATAAG ACTTAGACTC
മയയയാ	2801 2871 2941 3011 3081	2000074	485769	4131 4201 4271 4341 4411	4481 4551 4621

# FIG.\_49D

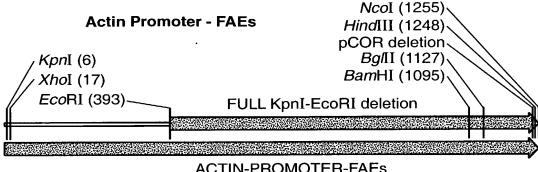
"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted 1 Plant Cell Walls." Expression of Genes Encoding Cell Wall..." SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 150 of 154

150 / 154

### AGAAAGAAAA TCGCGAGCAG ACTATATACA TACCCCCCC CCCCTCGCTG CCGGACGACG TCCTCTTTCT TTCTCCGTTT TCGFTGCGCG GGAGGGGCGG GATCTCGCGG CTGGCGTCTC CGGGCGTGAG TCGGCCCGGA TCCTCGCGGG CCTCAGCATT CTGGCAAATA GTCTCCACCC GAGCGGCTTC GTCGCCCAGA GTTCATCGGT AGTTTTTCTT TTCATGATTT GTGACAAATG CAGCCTCGTG CGGAGCTTTT TTGTAGC 111111 BamHI GAATGGGGCT CTCGGATGTA GATCTTCTTT CTTTCTTCTT TTTGTGGTAG AATTTGAATC GCGAGGAGGA AAAAAAAA GTGCAGCCAA TCGCAGCCAA GGCCGGAAAA CCCCATCGCC CACCTCCTCC CCCGCCCTC GGGTGGGCGA ACCCAACCCA ACCCACCCCA ACCGCACGTC GGGTCGTGGG AAGAAACGCC CCACCACCAC CGGTAACCAC TTGGTAGTTT TCCGCTTCCA 2022022522 ATCTTTGGCC TGTCCGCACC CCTACCACCA AGGTGGGTCC GCCCAACCCA CGGCCCTCCC TCCCCCCAAC CTCGGTCTCG CACCGTGAGT GAAAAACAGC CCCTCCCCT CGACGAGGCC TCTCCTCCCA AGCTCCTCCC AAAAGAAAA PTTTTTCGT CCGCCACTAT AGCAAGCCCA 4761 5181 4831 4901 4971 5041 5111 5251 5321

### FIG.\_49E

### 151 / 154



### ACTIN-PROMOTER-FAEs 1259 bp

	KpnI	Xh	.oI				
	~~~~	~~~~	. <b>~</b>				
<u>1</u>	GGTACCGGGC	CCCCCTCGA	GGTCATTCAT	ATGCTTGAGA	AGAGAGTCGG	GATAGTCCAA	AATAAAACAA
	CCATGGCCCG	GGGGGGAGCT	CCAGTAAGTA	$\underline{\texttt{TACGAACTCT}}$	$\underline{\mathtt{TCTCTCAGCC}}$	$\underline{\mathtt{CTATCAGGTT}}$	TTATTTTGTT
<u>71</u>	AGGTAAGATT	ACCTGGTCAA	AAGTGAAAAC	ATCAGTTAAA	AGGTGGTATA	AGTAAAATAT	CGGTAATAAA
	$\underline{\text{TCCATTCTAA}}$	TGGACCAGTT	TTCACTTTTG	TAGTCAATTT	$\underline{\mathtt{TCCACCATAT}}$	$\underline{\text{TCATTTTATA}}$	GCCATTATTT
<u>141</u>	AGGTGGCCCA	AAGTGAAATT	TACTCTTTTC	$\underline{\text{TACTATTATA}}$	AAAATTGAGG	ATGTTTTGTC	GGTACTTTGA
	TCCACCGGGT	$\underline{\text{TTCACTTTAA}}$	ATGAGAAAAG	ATGATAATAT	TTTTAACTCC	TACAAAACAG	CCATGAAACT
211	TACGTCATTT	TTGTATGAAT	TGGTTTTTAA	GTTTATTCGC	GATTTGGAAA	TGCATATCTG	TATTTGAGTC
	ATGCAGTAAA	AACATACTTA	ACCAAAAATT	CAAATAAGCG	$\underline{\mathtt{CTAAACCTTT}}$	ACGTATAGAC	ATAAACTCAG
<u>281</u>	GGTTTTTAAG	TTCGTTGCTT	TTGTAAATAC	AGAGGGATTT	GTATAAGAAA	TATCTTTAAA	AAACCCATAT
	$\underline{\mathtt{CCAAAAATTC}}$	AAGCAACGAA	$\underline{\mathtt{AACATTTATG}}$	$\underline{\mathtt{TCTCCCTAAA}}$	$\underline{\mathtt{CATATTCTTT}}$	$\underline{\textbf{ATAGAAATTT}}$	TTTGGGTATA
					EcoRI		
					~~~~		
<u>351</u>	GCTAATTTGA	$\underline{\textbf{CATAATTTTT}}$	GAGAAAAATA	TATATTCAGG	CGAATTCCAC	AATGAACAAT	AATAAGATTA
	CGATTAAACT	$\underline{\mathtt{GTATTAAAAA}}$	$\underline{\mathtt{CTCTTTTTAT}}$	ATATAAGTCC	$\underline{G}CTTAAGGTG$	TTACTTGTTA	TTATTCTAAT
421	AAATAGCTTG	CCCCCGTTGC	AGCGATGGGT	ATTTTTTCTA	GTAAAATAAA	AGATAAACTT	AGACTCAAAA
	TTTATCGAAC	GGGGCAACG	TCGCTACCCA	TAAAAAAGAT	CATTTTATTT	TCTATTTGAA	TCTGAGTTTT
491	CATTTACAAA	AACAACCCCT	AAAGTCCTAA	AGCCCAAAGT	GCTATGCACG	ATCCATAGCA	AGCCCAGCCC
	GTAAATGTTT	TTGTTGGGGA	TTTCAGGATT	TCGGGTTTCA	CGATACGTGC	TAGGTATCGT	TCGGGTCGGG
561	AACCCAACCC	AACCCAACCC	ACCCCAGTGC	AGCCAACTGG	CAAATAGTCT	CCACCCCCGG	CACTATCACC
	TTGGGTTGGG	TTGGGTTGGG	TGGGGTCACG	TCGGTTGACC	GTTTATCAGA	GGTGGGGGCC	GTGATAGTGG
631	GTGAGTTGTC	CGCACCACCG	CACGTCTCGC	AGCCAAAAAA	AAAAAAAGAA	AGAAAAAAA	GAAAAAGAAA
	CACTCAACAG	GCGTGGTGGC	GTGCAGAGCG	TCGGTTTTTT	TTTTTTTTTT	TCTTTTTTTT	CTTTTTCTTT
701	AACAGCAGGT	GGGTCCGGGT	CGTGGGGGCC	GGAAAAGCGA	GGAGGATCGC	GAGCAGCGAC	GAGGCCCGGC
	TTGTCGTCCA	CCCAGGCCCA	GCACCCCCGG	CCTTTTCGCT	CCTCCTAGCG	CTCGTCGCTG	CTCCGGGCCG
				~ <del></del>	· · · · · · · · · · · · · · · · · · ·		

"Manipulation of the Phenolic Acid Content and Digestibility of Plant Cell Walls by Targeted."

Expression of Genes Encoding Cell Wall..."

SN# 09/991,209, Dunn-Coleman et al.

Docket No. GC648-2

Sheet 152 of 154

### 152 / 154

771	CCTCCCTCCG	CTTCCAAAGA	AACGCCCCCC	ATCGCCACTA	TATACATACC	CCCCCTCTC	CTCCCATCCC
	GGAGGGAGGC	GAAGGTTTCT	TTGCGGGGGG	TAGCGGTGAT	ATATGTATGG	GGGGGGAGAG	GAGGGTAGGG
841	CCCAACCCTA	CCACCACCAC	CACCACCACC	TCCTCCCCC	TCGCTGCCGG	ACGACGAGCT	CCTCCCCCCT
	GGGTTGGGAT	GGTGGTGGTG	GTGGTGGTGG	AGGAGGGGG	AGCGACGGCC	TGCTGCTCGA	GGAGGGGGGA
911	CCCCCTCCGC	CGCCGCCGGT	AACCACCCCG	CCCCTCTCCT	CTTTCTTTCT	CCGTTTTTTT	TTTCGTCTCG
	GGGGGAGGCG	GCGGCGGCCA	TTGGTGGGGC	GGGGAGAGGA	GAAAGAAAGA	GGCAAAAAA	AAAGCAGAGC
981	GTCTCGATCT	TTGGCCTTGG	TAGTTTGGGT	GGGCGAGAGC	GGCTTCGTCG	CCCAGATCGG	TGCGCGGGAG
	CAGAGCTAGA	AACCGGAACC	ATCAAACCCA	CCCGCTCTCG	CCGAAGCAGC	GGGTCTAGCC	ACGCGCCCTC
					BamHI		
					~~~~~		
1051	GGGCGGGATC	TCGCGGCTGG	CGTCTCCGGG	CGTGAGTCGG	CCCGGATCCT	CGCGGGGAAT	GGGGCTCTCG
	CCCGCCCTAG	AGCGCCGACC	GCAGAGGCCC	GCACTCAGCC	GGGCCTAGGA	GCGCCCCTTA	CCCCGAGAGC
	Bg1I:	I					
	~~~~	~~					
1121			CTTCTTTTTG				
	CTACATCTAG	AAGAAAGAAA	GAAGAAAAAC	ACCATCTTAA	ACTTAGGGAG	TCGTAACAAG	TAGCCATCAA
						1-	<b>_</b>
						Hind	III NcoI
	mmm.cmmmm.c.	max.mmmamax	03337F007C0	amaamaaaa.		~~~~ አር <b>ሮጥ እ ሮ</b> አ አርር	~~~ ~~~~~ ጥጥአ <i>ርር</i> አጥርር
1191			CAAATGCAGC				
	AAAGAAAAGT	ACTAAACACT	GTTTACGTCG	GAGCACGCCT	CGAAAAAAACA	TCCATCTTCG	AAIGGIACC

KpnI-EcoRI - deletion underlined and restored NCO site in bold in vectors pJQ4.9, pJQ3.2 and pJO6.3.

FIG.\_50B

### 153 / 154

### ALEURAIN\_deleted NPIR (Apoplast) Structure and Sequence



### ALEURAIN-NPIR-DEL 93 bp

+1 M A H A R V L L L A L A V L A T A A V A HindIII Ncol

1 AAGCTTACCA TGGCCCACGC CCGCGTCCTC CTCCTGGCGC TCGCCGTGCT GGCCACGGCC GCCGTCGCCG
TTCGAATGGT ACCGGGTGCG GGCGCAGGAG GAGGACCGCG AGCGGCACGA CCGGTGCCGG CGGCAGCGGC

+1 V A S S R A A

~~~~~

NotI

71 TCGCCTCCTC CCGCGCGGCC GCC
AGCGGAGGAG GGCGCCCGG CGG

FIG.\_51

SN# 09/991,209; Dunn-Coleman et al. Docket No. GC648-2 Sheet 154 of 154

### 154 / 154

### SEE1 (Senescence enhanced) PROMOTER sequence

| 1   | CATGGGCCAG | GTATAATTAT | GGGATATCTC | AAGCAAATAA | TCGAAATATC         | ACCATTGGCT | ACAATATCTG |
|-----|------------|------------|------------|------------|--------------------|------------|------------|
|     |            | PstI       |            |            | XbaI Y             | KbaI       |            |
|     |            | ~~~~       | ~          |            | ~~~~~~ ~~          | -~~~       |            |
| 71  | AGCTCCGAGT | TCTGACTGCA | GTCTGGATGA | CGCGTGTTGT | ATCTAGAACT         | CTAGATAGCA | CAGCCACAGC |
| 141 | ACCTACAGGA | GTGCGACACT | TGTGGACTGT | AGTAGTGTTG | GAGACGGAGC         | TCTTTCCTAC | CTCCTGACGT |
| 211 | TGCCGCCGTT | GTCCATTCCA | ACGGCATCAC | TCTCAACCAA | TCACGCGCTC         | CCAACAAAAT | ATCGTCCCCC |
| 281 | ATGTCTTGGC | GGAGAGAGAG | TACATACATG | CTGTCGCGCC | GTTTTTGTCT         | GAATCTCGCT | TCCACTGGCC |
|     |            | SmaI       |            |            |                    |            |            |
|     |            | ~~~~~      |            |            |                    |            |            |
| 351 | AATCAGCTCA | GCTCCCGGGA | GCTCACTCAT | TCAAGATCCC | ATCGTCGTCG         | TCACCCTGG  | CGTCATGGGA |
| 421 | TGGAAAAGAA | CCTCCGTTGC | TCGGATGAGT | CAGCCATATC | CCCGAACAGA         | GTACTGCAAG | ATAACCCAAT |
|     |            |            | Spl        | nΙ         |                    |            |            |
|     |            |            | ~~~        | ~~~        |                    |            |            |
| 491 | TCAGATTCCC | CCAATAGAGA | AAGTATAGCA | TGCTTTCGGG | ${\tt TTTTGTTTGG}$ | CTTAATTGAC | TTTATTTTTG |
| 561 | TTGGAGTTGA | ATGCTGATTT | GTTGTGTAAA | ATGCCCAACC | ATCTGAATAT         | CGAGACGGAT | AATAGGCTGG |
| 631 | CTAATTAATT | TATAGCAAGA | TTCTGTAGTG | CACATCGCAA | ATATCTTTCT         | GGGCATTACA | GCTGGAGGCT |
|     |            | Ps         | stI        |            |                    |            |            |
|     |            | ~~-        | ~~~~       |            |                    |            |            |
| 701 | TCATCAGCCT | GAAACACTCT | GCAGAGCCTG | AAGCAAGTGG | ${\tt TGAAGCGTGG}$ | CGATGAGATG | GGTATAAAAC |
| 771 | CCCCGGCACC | GGGACGCGAG | CTCCCGCCTA | CCAGTACCAT | CTCGCCTCGC         | TCCCCCTGCC | GGACGACCCA |
| 841 | GTAAAATACT | GTTGCCCACT | CGCCGGCGAG | ATG        |                    |            |            |
|     |            |            |            |            |                    |            |            |

### FIG.\_52

### SEE1 (Senescence enhanced) PROMOTER plus vacuolar aleurain SIGNAL/NPIR sequence

| 1   | CATGGGCCAG         | GTATAATTAT         | GGGATATCTC   | AAGCAAATAA |            |            | ACAATATCTG |
|-----|--------------------|--------------------|--------------|------------|------------|------------|------------|
|     |                    | PstI               |              |            | XbaI X     | KbaI       |            |
|     |                    | ~~~~               |              |            | ~~~~~~     | -~~~       |            |
| 71  |                    | ${\tt TCTGACTGCA}$ |              |            |            |            |            |
| 141 |                    | ${\tt GTGCGACACT}$ |              |            |            |            |            |
| 211 |                    | GTCCATTCCA         |              |            |            |            |            |
| 281 | ATGTCTTGGC         | GGAGAGAGAG<br>SmaI | TACATACATG   | CTGTCGCGCC | GTTTTTGTCT | GAATCTCGCT | TCCACTGGCC |
|     |                    | ~~~~~~             |              |            |            |            |            |
| 351 |                    | $\tt GCTCCCGGGA$   |              |            |            |            |            |
| 421 | TGGAAAAGAA         | CCTCCGTTGC         | TCGGATGAGT   | CAGCCATATC | CCCGAACAGA | GTACTGCAAG | ATAACCCAAT |
|     |                    |                    | Spl          | nI         |            |            |            |
|     |                    |                    | ~~~          | ~~~        |            |            |            |
| 491 |                    | CCAATAGAGA         |              |            |            |            |            |
| 561 |                    | ATGCTGATTT         |              |            |            |            |            |
| 631 | CTAATTAATT         | TATAGCAAGA         | TTCTGTAGTG   | CACATCGCAA | ATATCTTTCT | GGGCATTACA | GCTGGAGGCT |
|     |                    | Ps                 | stI          |            |            |            |            |
|     |                    | ~~                 | ~~~~         |            |            |            |            |
| 701 |                    | GAAACACTCT         |              |            |            |            |            |
| 771 | CCCCGGCACC         | GGGACGCGAG         | CTCCCGCCTA   | CCAGTACCAT |            |            |            |
|     |                    |                    |              |            | 3 RIL      | FLA        | LAVL       |
| 841 | GTAAAATACT         | GTTGCCCACT         | CGCCGGCGAG   | ATGGCCCACG | GCCGCATCCT | CTTCTTGGCG | CTCGCCGTCT |
|     |                    |                    |              |            |            |            | BssHII     |
|     |                    |                    |              |            |            |            | NotI       |
|     | · A T A            | A V A              |              | L A D S    | N P I      | ** - *     | T E R A ·  |
| 911 | TGGCCACCGC<br>NotI | CGCGGTGGCC         | GCCGCATCNT   | TGGCGGACTC | CAACCCGATC | CGGCCCGTCA | CCGAGCGCGC |
|     | ~~~~~              |                    |              |            |            |            |            |
|     | · A A              |                    |              | 0 =0       |            |            |            |
| 981 | GGCCGCC            |                    | <i>F1</i> (  | G53        |            |            |            |
|     |                    |                    | - <b>-</b> · |            |            |            | 1          |